zenith

SERVICE MANUAL

MODEL : ZH-T202SF

zenith

SERVICE MANUAL

Model Series:

ZH-T202SF

Product Type: DVD HOME THEATER SYSTEM
Chassis: DP10-T
Manual Series: ZH-T202SF
Manual Part #: AFN32633706
Model Line: C
Product Year: 2007

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SECTION 1. GENERAL

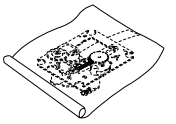
SERVICING PRECAUTIONS

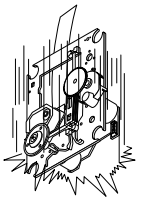
NOTES REGARDING HANDLING OF THE PICK-UP

1. Notes for transport and storage

1) The pick-up should always be left in its conductive bag until immediately prior to use.
2) The pick-up should never be subjected to external pressure or impact.

Storage in conductive bag

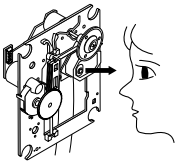




Drop impact

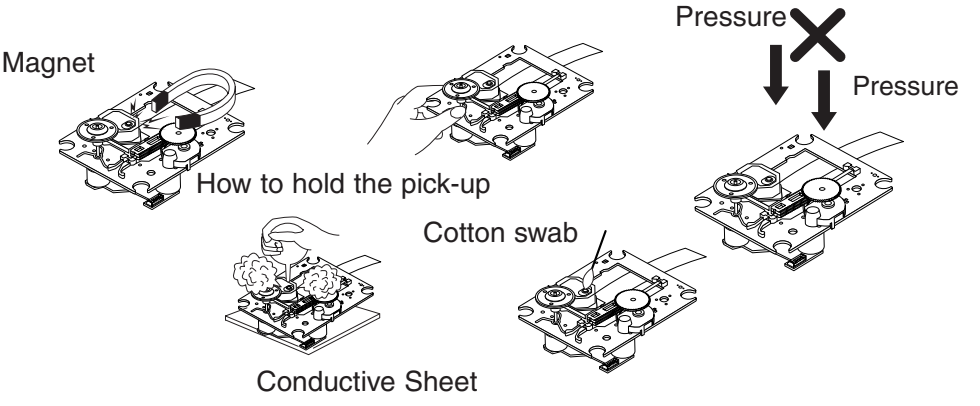
2. Repair notes

1) The pick-up incorporates a strong magnet, and so should never be brought close to magnetic materials.
2) The pick-up should always be handled correctly and carefully, taking care to avoid external pressure and impact. If it is subjected to strong pressure or impact, the result may be an operational malfunction and/or damage to the printed-circuit board.
3) Each and every pick-up is already individually adjusted to a high degree of precision, and for that reason the adjustment point and installation screws should absolutely never be touched.
4) Laser beams may damage the eyes!
   Absolutely never permit laser beams to enter the eyes!
   Also NEVER switch ON the power to the laser output part (lens, etc.) of the pick-up if it is damaged.



NEVER look directly at the laser beam, and don't allow contact with fingers or other exposed skin.

5) Cleaning the lens surface
   If there is dust on the lens surface, the dust should be cleaned away by using an air bush (such as used for camera lens). The lens is held by a delicate spring. When cleaning the lens surface, therefore, a cotton swab should be used, taking care not to distort lens.



6) Never attempt to disassemble the pick-up.
   Spring has excess pressure. If the lens is extremely dirty, apply isopropyl alcohol to the cotton swab. (Do not use any other liquid cleaners, because they will damage the lens.) Take care not to use too much of this alcohol on the swab, and do not allow the alcohol to get inside the pick-up.

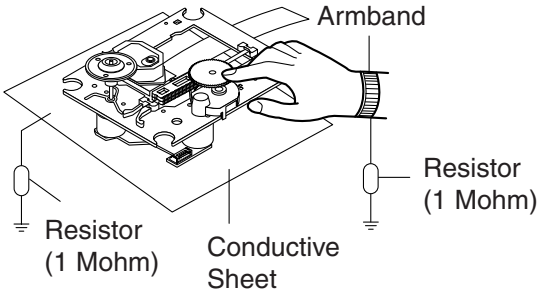
NOTES REGARDING COMPACT DISC PLAYER REPAIRS

1. Preparations

1) Compact disc players incorporate a great many ICs as well as the pick-up (laser diode). These components are sensitive to, and easily affected by, static electricity. If such static electricity is high voltage, components can be damaged, and for that reason components should be handled with care.
2) The pick-up is composed of many optical components and other high-precision components. Care must be taken, therefore, to avoid repair or storage where the temperature or humidity is high, where strong magnetism is present, or where there is excessive dust.

2. Notes for repair

1) Before replacing a component part, first disconnect the power supply lead wire from the unit
2) All equipment, measuring instruments and tools must be grounded.
3) The workbench should be covered with a conductive sheet and grounded.
   When removing the laser pick-up from its conductive bag, do not place the pick-up on the bag. (This is because there is the possibility of damage by static electricity.)
4) To prevent AC leakage, the metal part of the soldering iron should be grounded.
5) Workers should be grounded by an armband (1M Ω)
6) Care should be taken not to permit the laser pick-up to come in contact with clothing, in order to prevent static electricity changes in the clothing to escape from the armband.
7) The laser beam from the pick-up should NEVER be directly facing the eyes or bare skin.



ESD PRECAUTIONS

Electrostatically Sensitive Devices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ESD devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.
6. Do not remove a replacement ESD device from its protective package until immediately before you are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).
7. Immediately before removing the protective material from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will by installed.

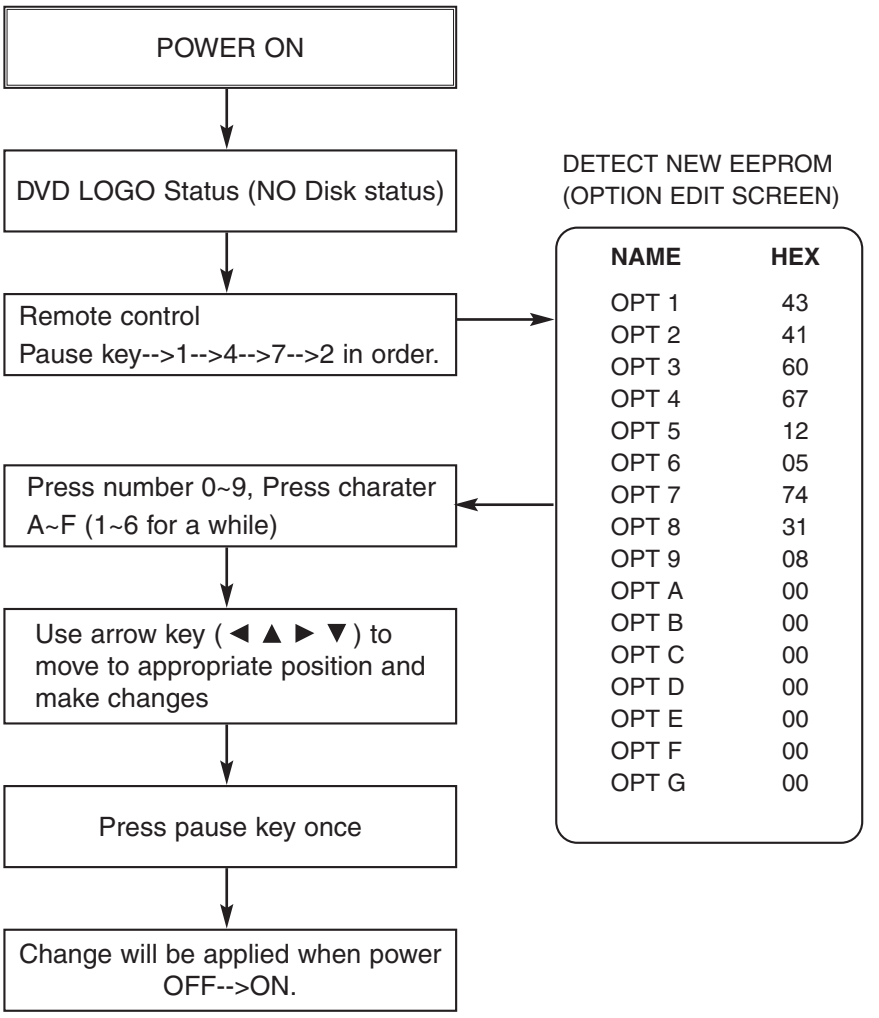
CAUTION : BE SURE NO POWER IS APPLIED TO THE CHASSIS OR CIRCUIT, AND OBSERVE ALL OTHER SAFETY PRECAUTIONS.

8. Minimize bodily motions when handing unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

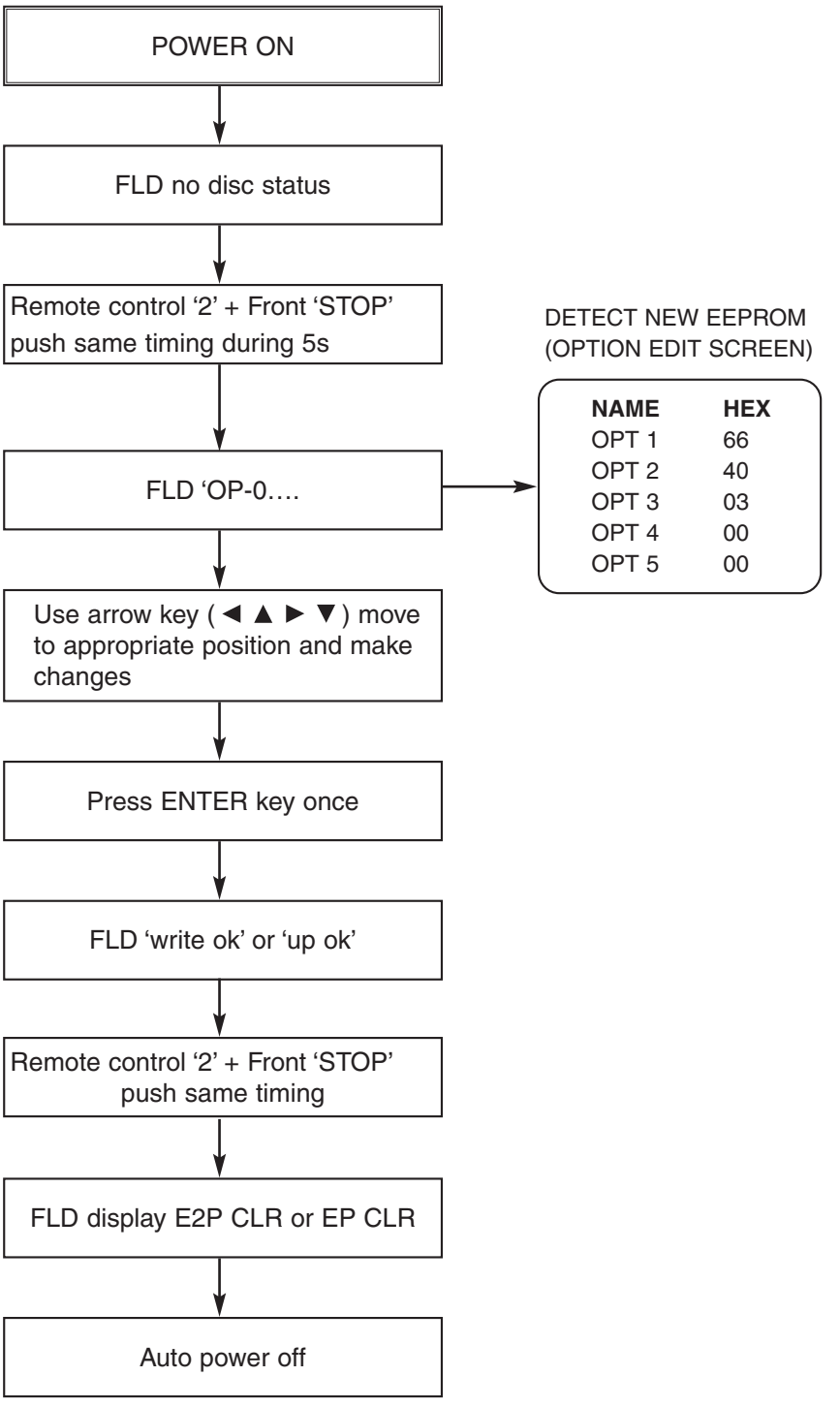
CAUTION. GRAPHIC SYMBOLS

	THE LIGHTNING FLASH WITH APROWHEAD SYMBOL. WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED “DANGEROUS VOLTAGE” THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.
	THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

SERVICE INFORMATION FOR EEPROM (DVD PART)



SERVICE INFORMATION FOR EEPROM (AMP PART)


POWER ON
FLD no disc status
Remote control '2' + Front 'STOP' push same timing during 5s
FLD 'OP-0….
Use arrow key (◄ ▲ ► ▼) move to appropriate position and make changes
Press ENTER key once
FLD 'write ok' or 'up ok'
Remote control '2' + Front 'STOP' push same timing
FLD display E2P CLR or EP CLR
Auto power off
DETECT NEW EEPROM
(OPTION EDIT SCREEN)
NAME HEX
OPT 1 66
OPT 2 40
OPT 3 03
OPT 4 00
OPT 5 00

SPECIFICATIONS

GENERAL

Power supply	Refer to main label
Power consumption	Refer to main label
Net Weight	2.4 kg
External dimensions (W x H x D)	360 x 63 x 307 mm
Operating conditions	Temperature: 5°C to 35°C, Operation status: Horizontal
Operating humidity	5% to 85%

CD/DVD

Laser	Semiconductor laser, wavelength 650 nm
Signal system	NTSC 525/60
Frequency response (audio)	160 Hz to 18 kHz
Signal-to-noise ratio (audio)	More than 75 dB (1 kHz, NOP -6 dB, 20 kHz LPF/A-Filter)
Dynamic range (audio)	More than 70 dB
Harmonic distortion (audio)	0.5 % (1 kHz, at 1W position) (20 kHz LPF)

VIDEO

Video output	1.0 V (p-p), 75 Ω, negative sync. RCA jack x 1
COMPONENT VIDEO OUT	(Y) 1.0 V (p-p), 75 ohms, negative sync, RCA jack x 1 (Pb)/(Pr) 0.7 V (p-p), 75 ohms, RCA jack x 1

TUNER

FM

Tuning Range	87.5 - 108.0 MHz or 65.0 - 74.0 MHz, 87.5 - 108.0 MHz
Intermediate Frequency	10.7 MHz
Signal-to Noise Ratio	60 dB (Mono)
Frequency Response	160 - 10,000 Hz

AM [MW]

Tuning Range	522 - 1,620 kHz or 520 - 1,720 kHz
Intermediate Frequency	450 kHz

AMPLIFIER

Stereo mode	30W + 30W (Rated Output Power 20W, 4 Ωat 1 kHz, THD 10 %)
Surround mode	Front: 30W + 30W (Rated Output Power 20W, THD 10 %)
(* Depending on the sound mode settings and the source, there may be no sound output.)	Center*: 30W Surround*: 30W + 30W (Rated Output Power 20W, 4 Ωat 1 kHz, THD 10 %) Subwoofer*: 50W (Rated Output Power 40W, 8 Ωat 30 Hz, THD 10 %)
Inputs	AUX IN

SPEAKERS

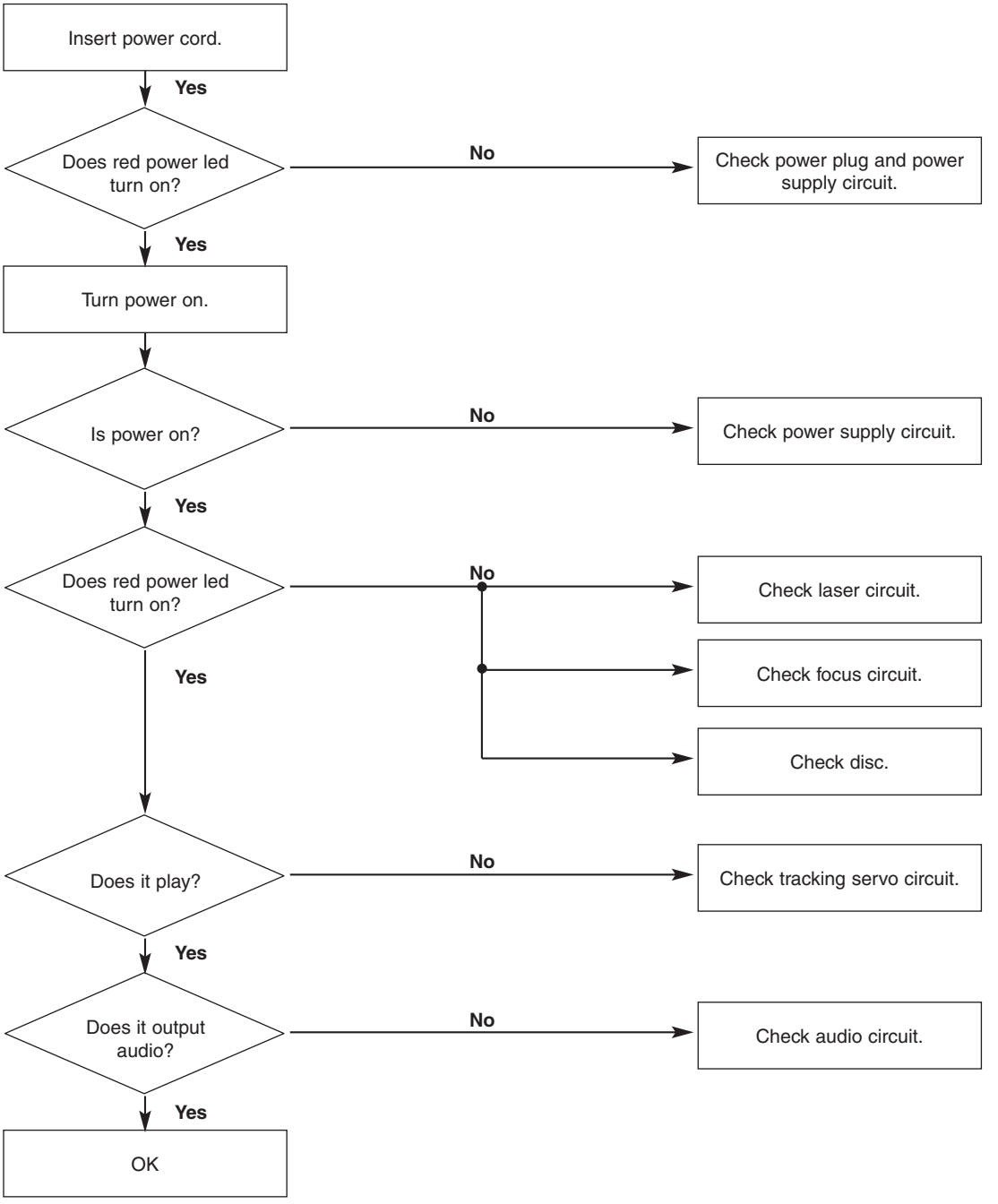
	Front/Rear/ CenterSpeaker (SH22SF-SY)	Passive Subwoofer (SH22SF-WY)
Type	1 Way1 Speaker	1 Way 1 Speaker
Impedance	4 Ω	8 Ω
Frequency Response	160 - 20,000 Hz	65 - 1,500 Hz
Sound Pressure Level	83 dB/W (1m)	84 dB/W (1m)
Rated Input Power	30 W	50 W
Max. Input Power	60 W	100 W
Net Dimensions (W x H x D)	94 x 102 x 88 mm	144 x 250 x 230 mm
Net Weight	0.35kg	2.81kg

MEMO

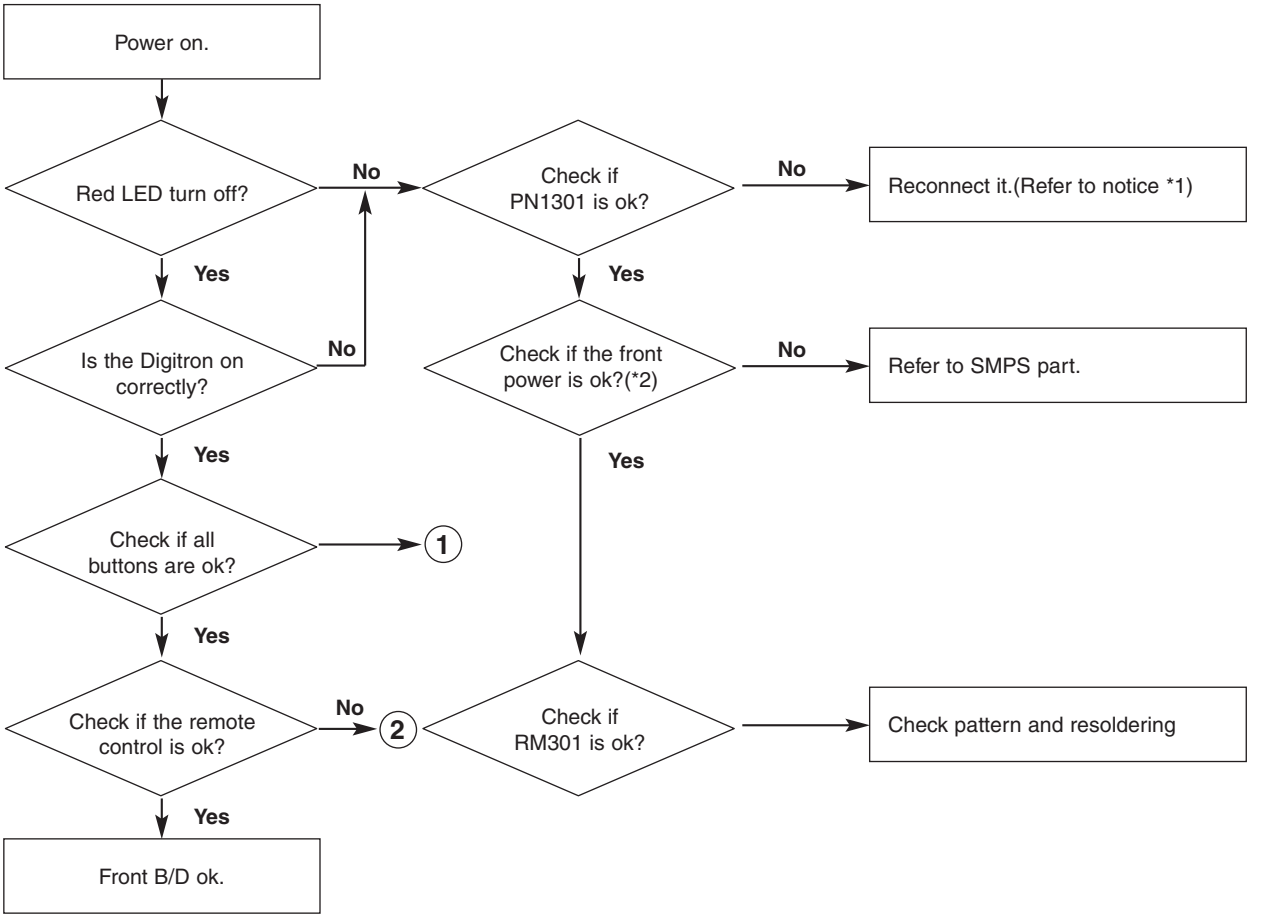
SECTION 2. AUDIO PART

AUDIO TROUBLESHOOTING GUIDE

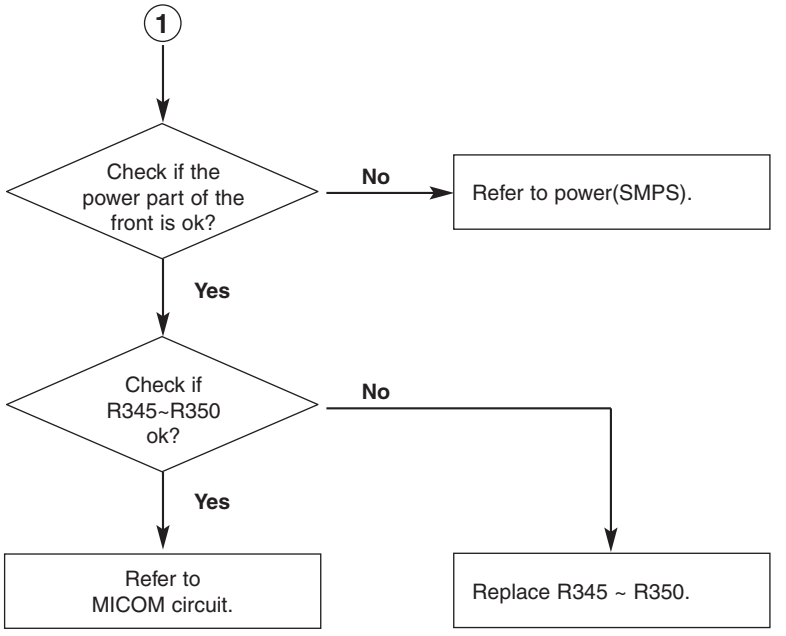
1. Power Supply Circuit

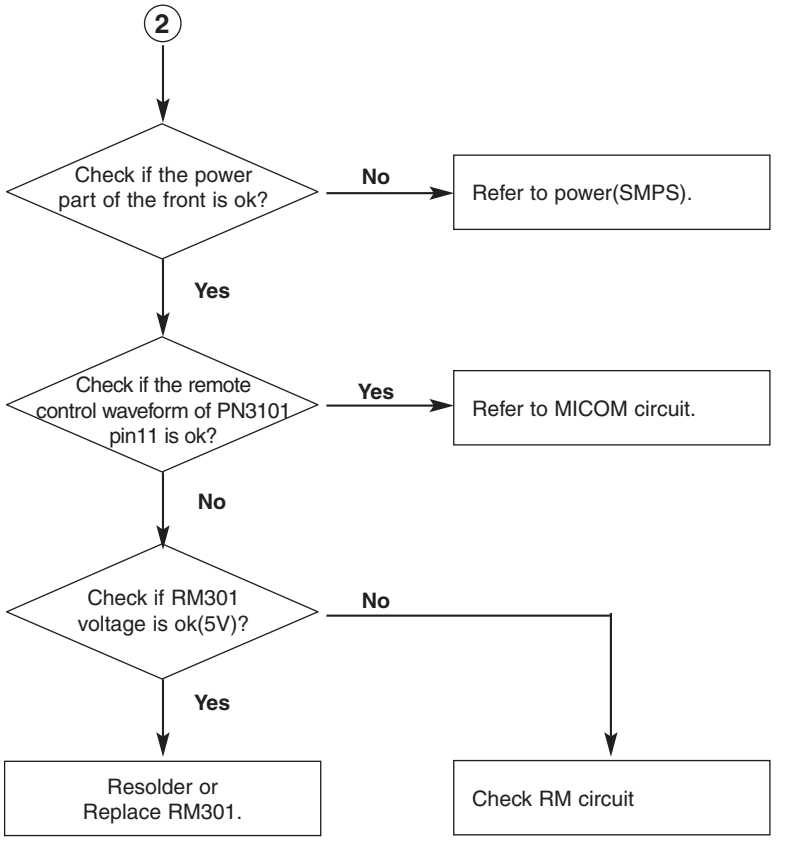


2. Front circuit (1/2)



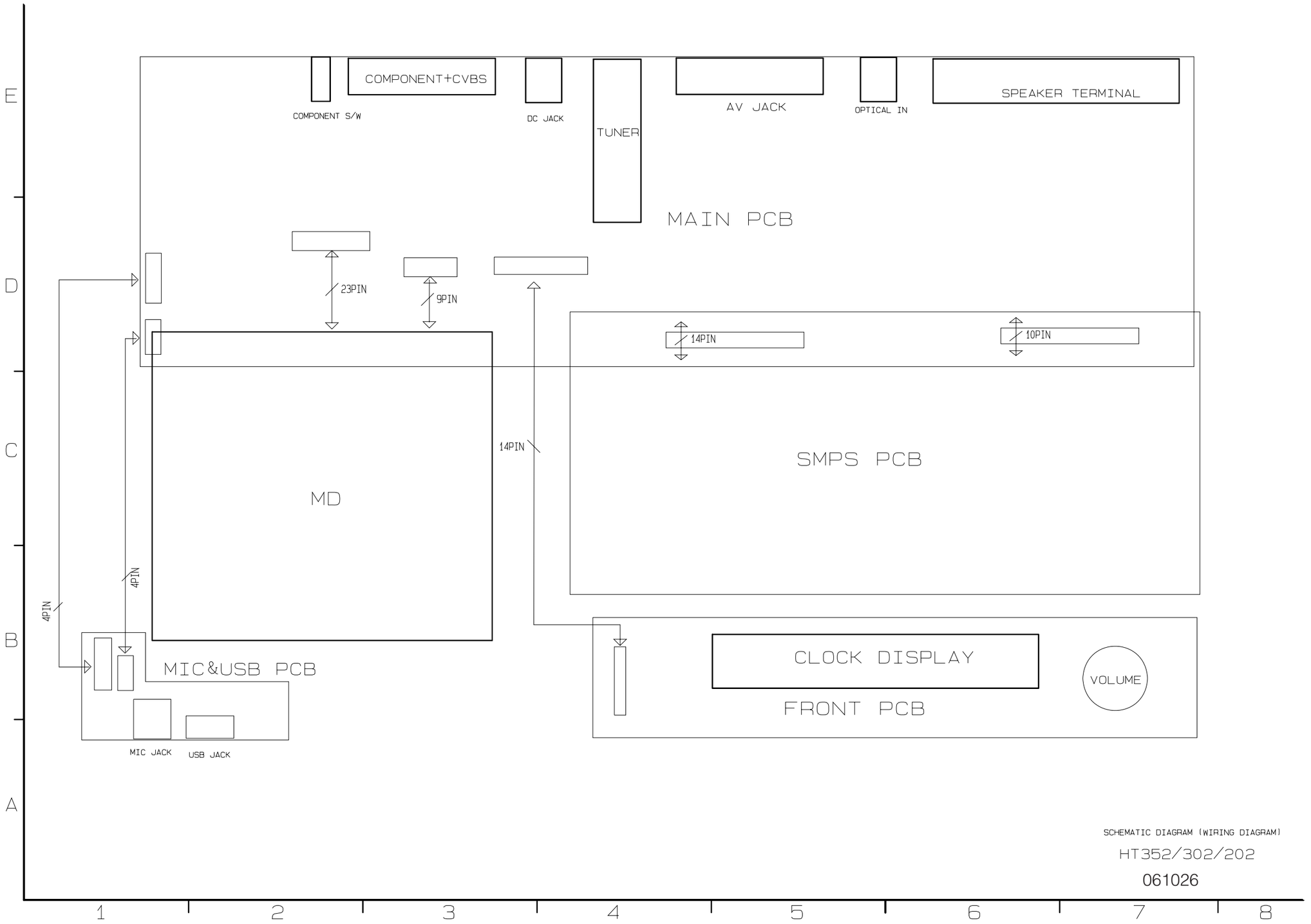
3. Front circuit (2/2)





MEMO

WIRING DIAGRAM

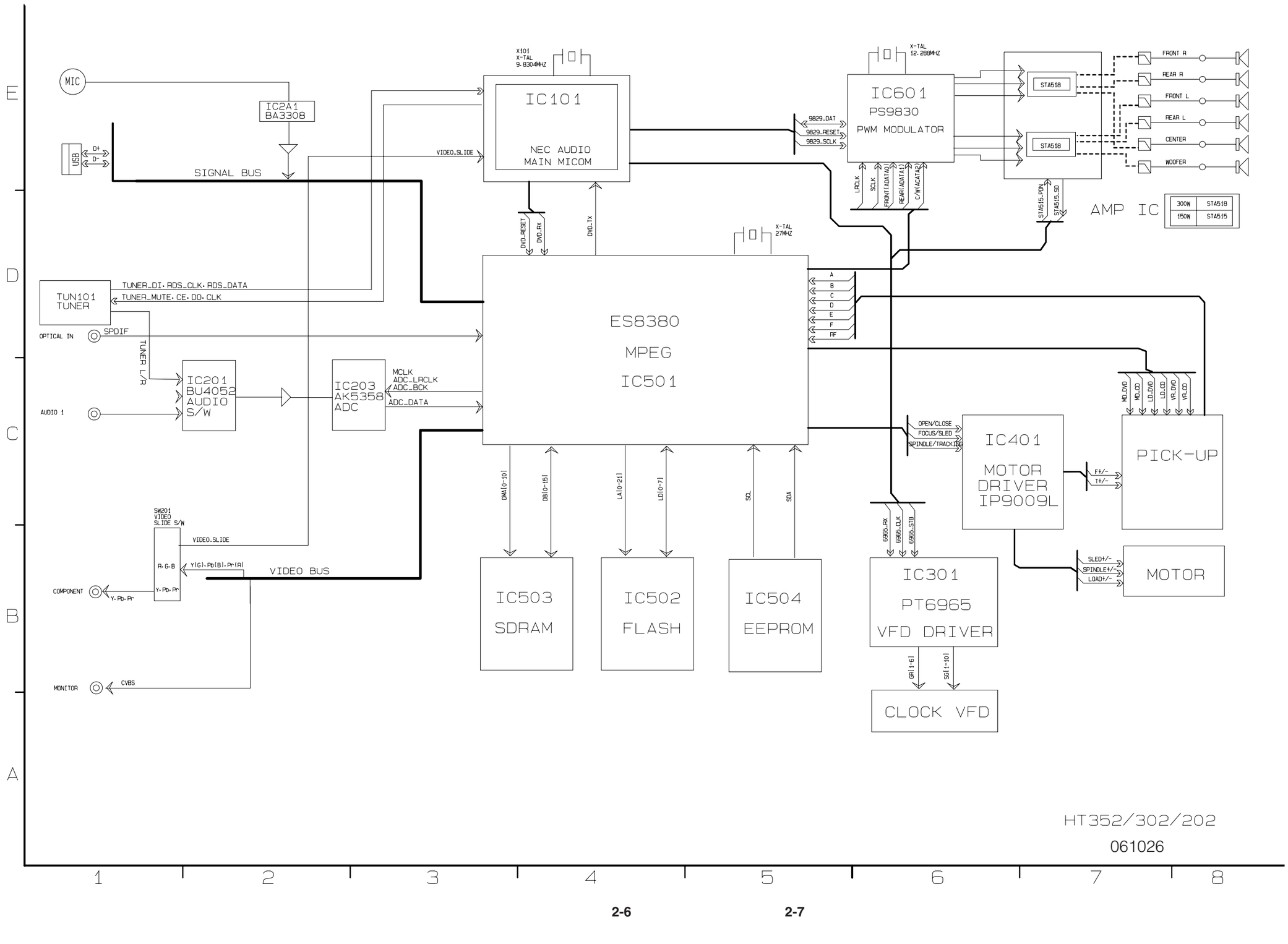


SCHEMATIC DIAGRAM (WIRING DIAGRAM)

HT352/302/202

061026

BLOCK DIAGRAM



HT352/302/202

061026

CIRCUIT DIAGRAMS

1. SMPS(POWER) CIRCUIT DIAGRAM

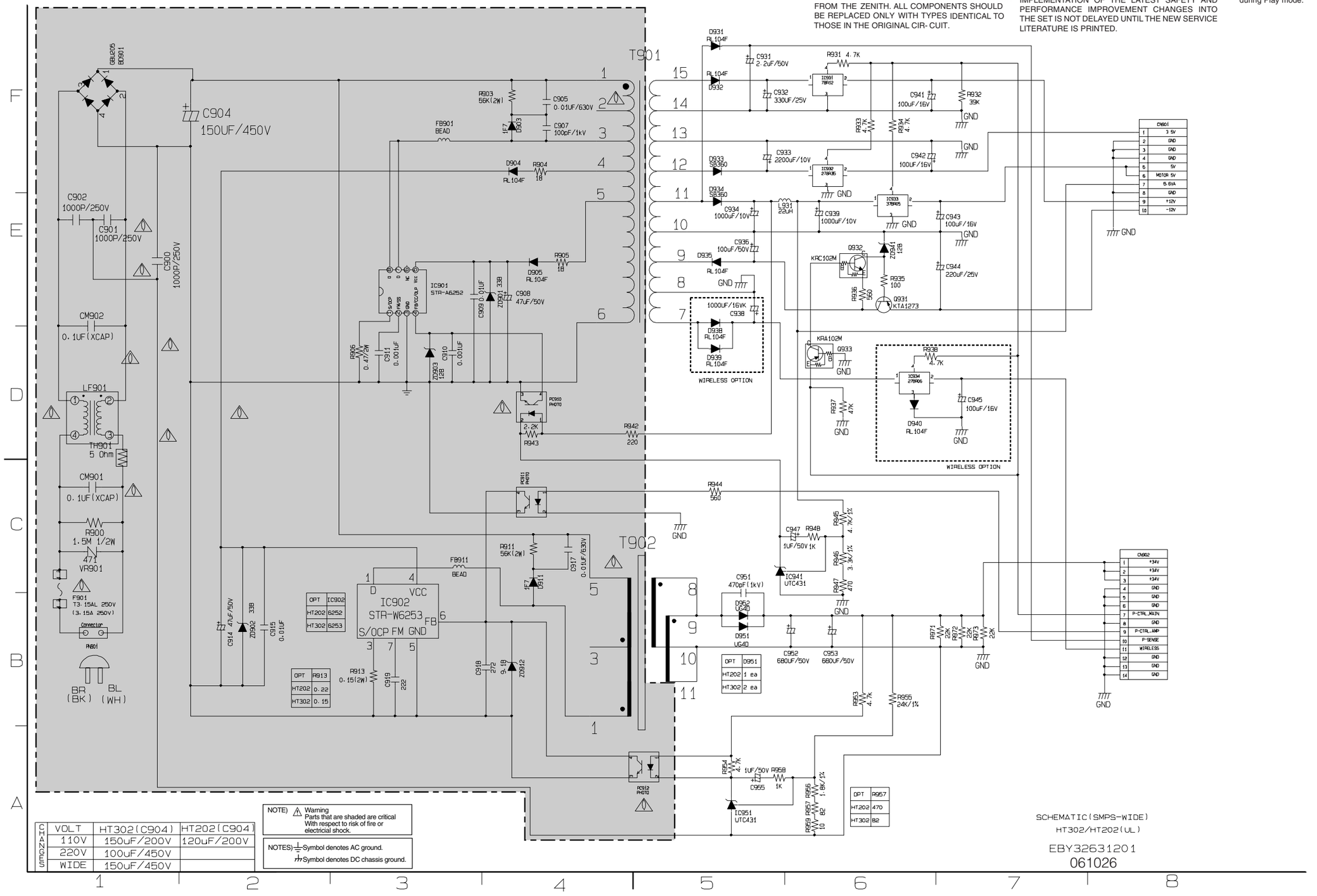
IMPORTANT SAFETY NOTICE

WHEN SERVICING THIS CHASSIS, UNDER NO CIR-CUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE ZENITH. ALL COMPONENTS SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL CIR- CUIT.

SPECIAL COMPONENTS ARE SHADED ON THE SCHEMATIC FOR EASY IDENTIFICATION.
THIS CIRCUIT DIAGRAM MAY OCCASIONALLY DIF-FER FROM THE ACTUAL CIRCUIT USED. THIS WAY, IMPLEMENTATION OF THE LATEST SAFETY AND PERFORMANCE IMPROVEMENT CHANGES INTO THE SET IS NOT DELAYED UNTIL THE NEW SERVICE LITERATURE IS PRINTED.

NOTE :

1. Shaded(■) parts are critical for safety. Replace only with specified part number.
2. Voltages are DC-measured with a digital voltmeter during Play mode.



CIRCUIT	VOLT	HT302(C904)	HT202(C904)
	110V	150uF/200V	120uF/200V
	220V	100uF/450V	
	WIDE	150uF/450V	

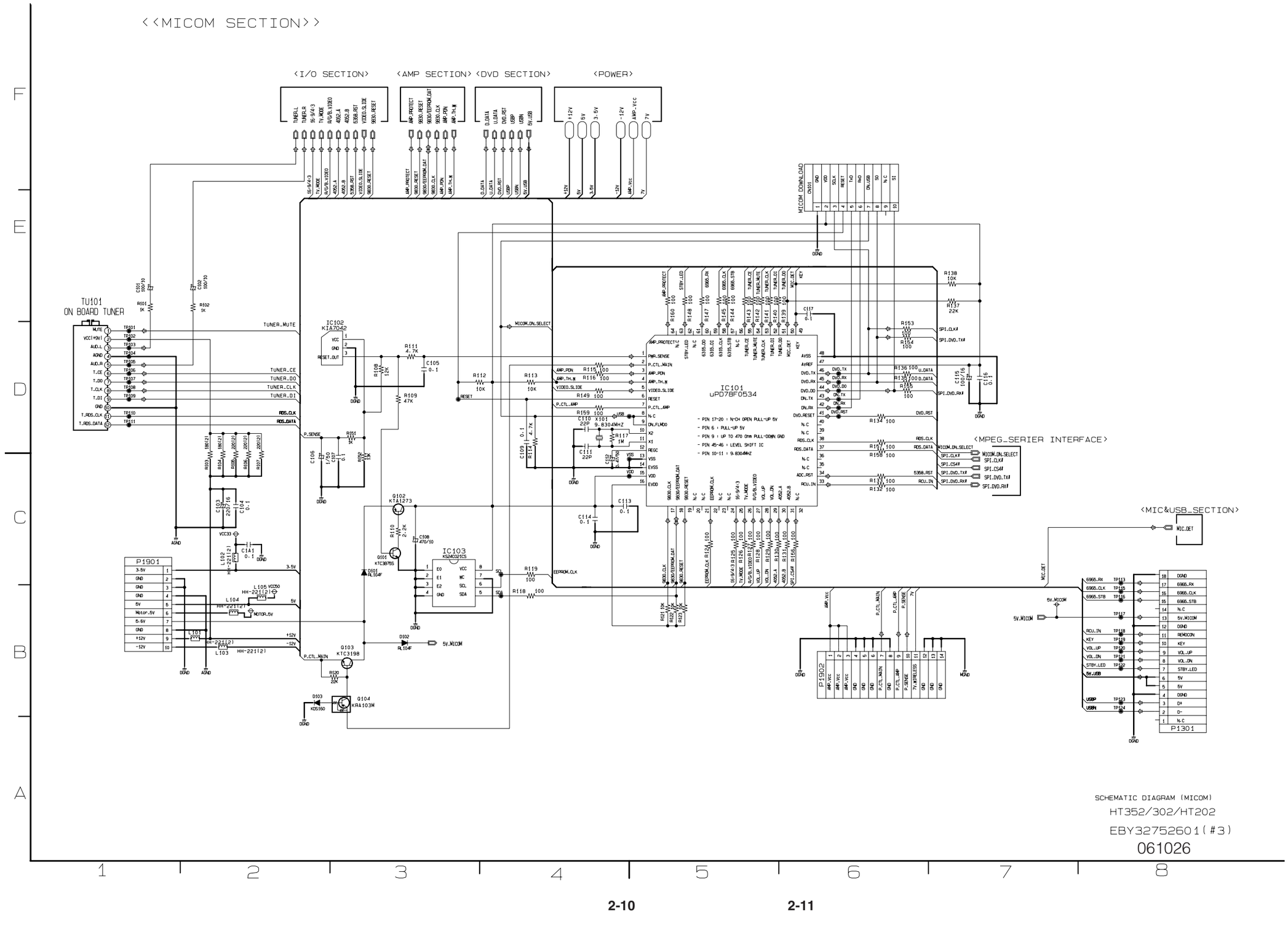
NOTE) ⚠ Warning
Parts that are shaded are critical With respect to risk of fire or electricial shock.

NOTES) ⏚ Symbol denotes AC ground.
⏚ Symbol denotes DC chassis ground.

SCHEMATIC(SMPS-WIDE)
HT302/HT202(UL)

EBY32631201
061026

2. µ-COM(MAIN) CIRCUIT DIAGRAM



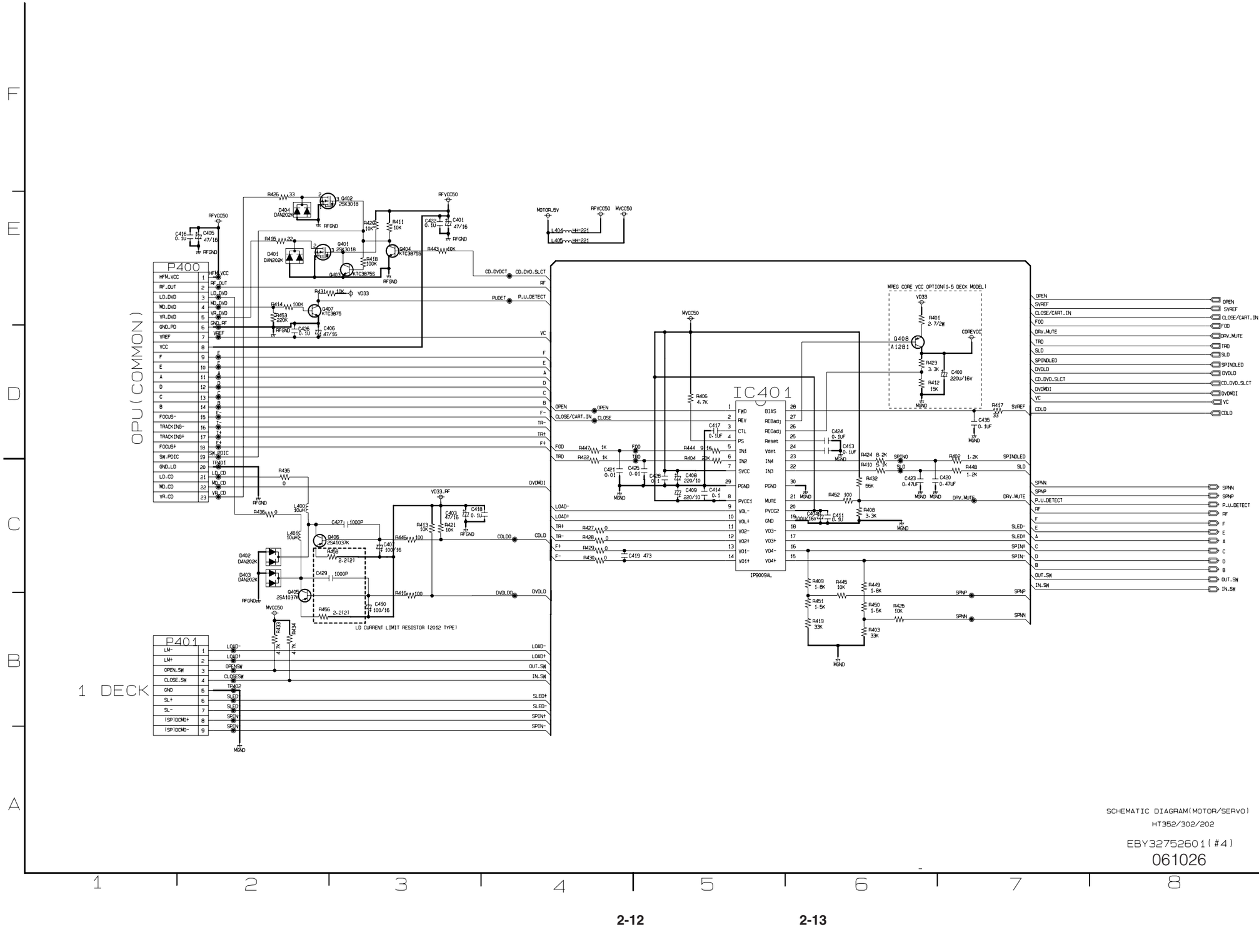
SCHEMATIC DIAGRAM (MICOM)

HT352/302/HT202

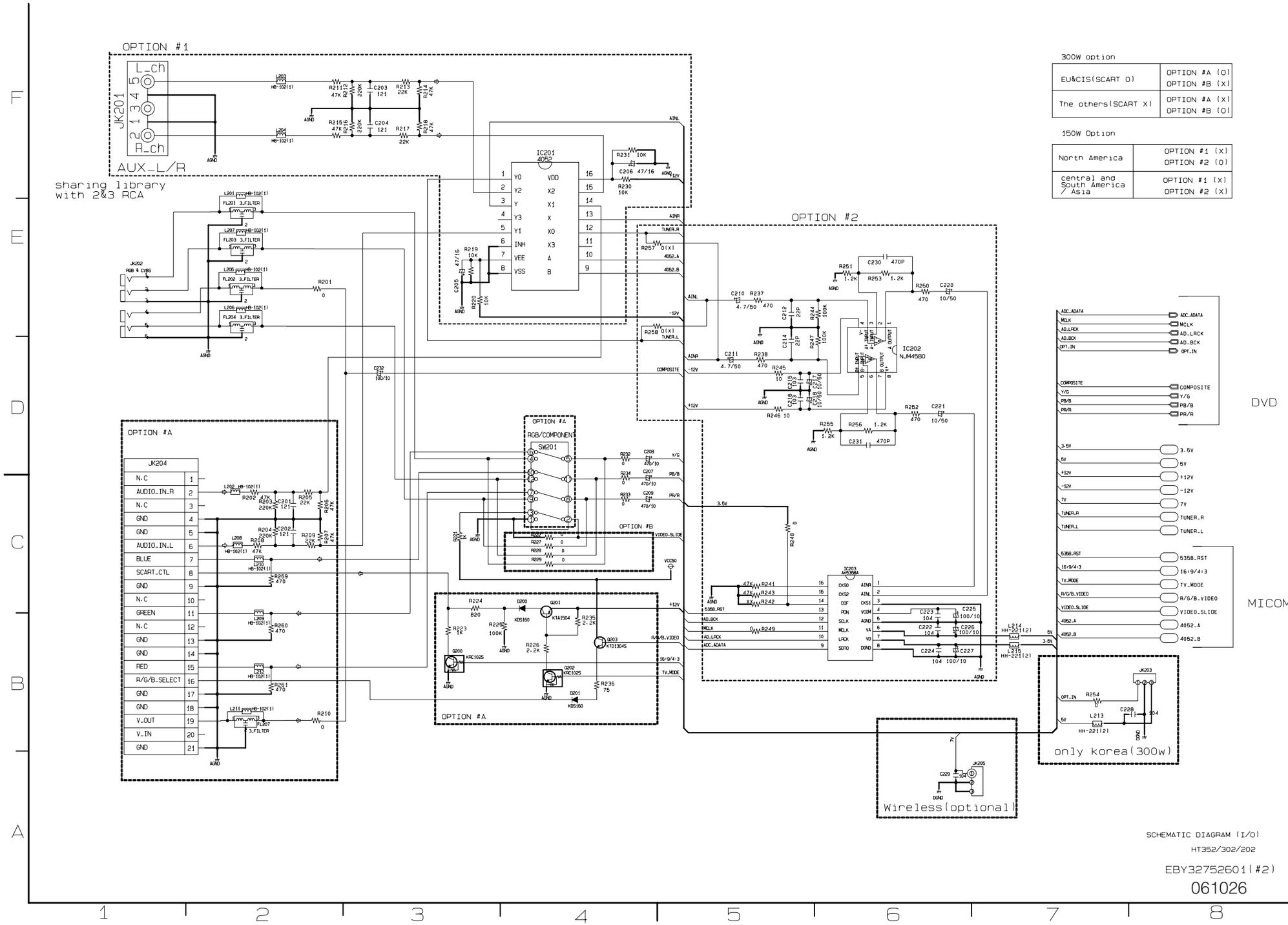
EBY32752601(#3)

061026

3. MOTOR & SERVO CIRCUIT DIAGRAM



4. I/O CIRCUIT DIAGRAM



300W option

EU&CIS(SCART O)	OPTION #A (O) OPTION #B (X)
The others(SCART X)	OPTION #A (X) OPTION #B (O)

150W Option

North America	OPTION #1 (X) OPTION #2 (O)
central and South America / Asia	OPTION #1 (X) OPTION #2 (X)

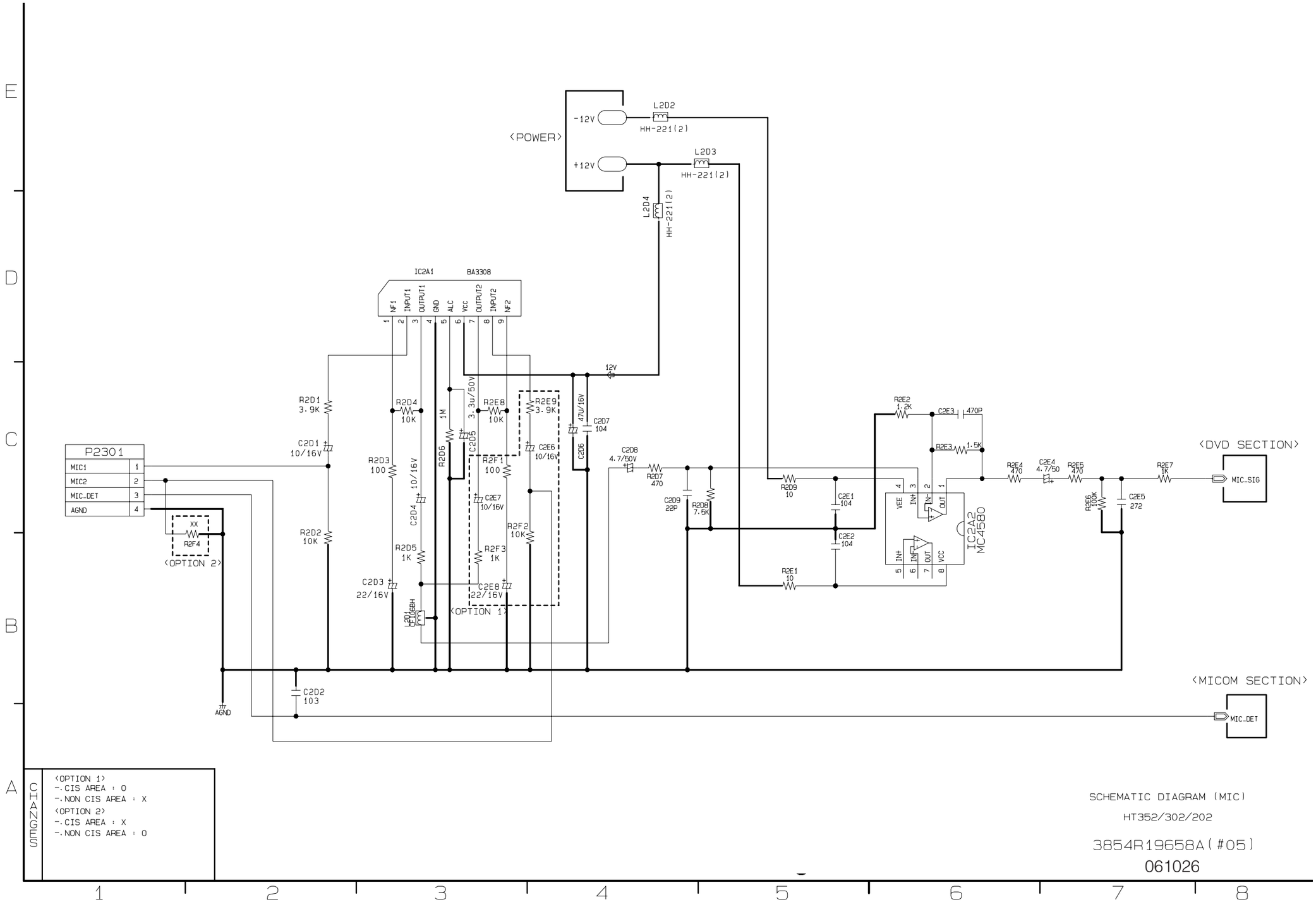
SCHEMATIC DIAGRAM (I/O)

HT352/302/202

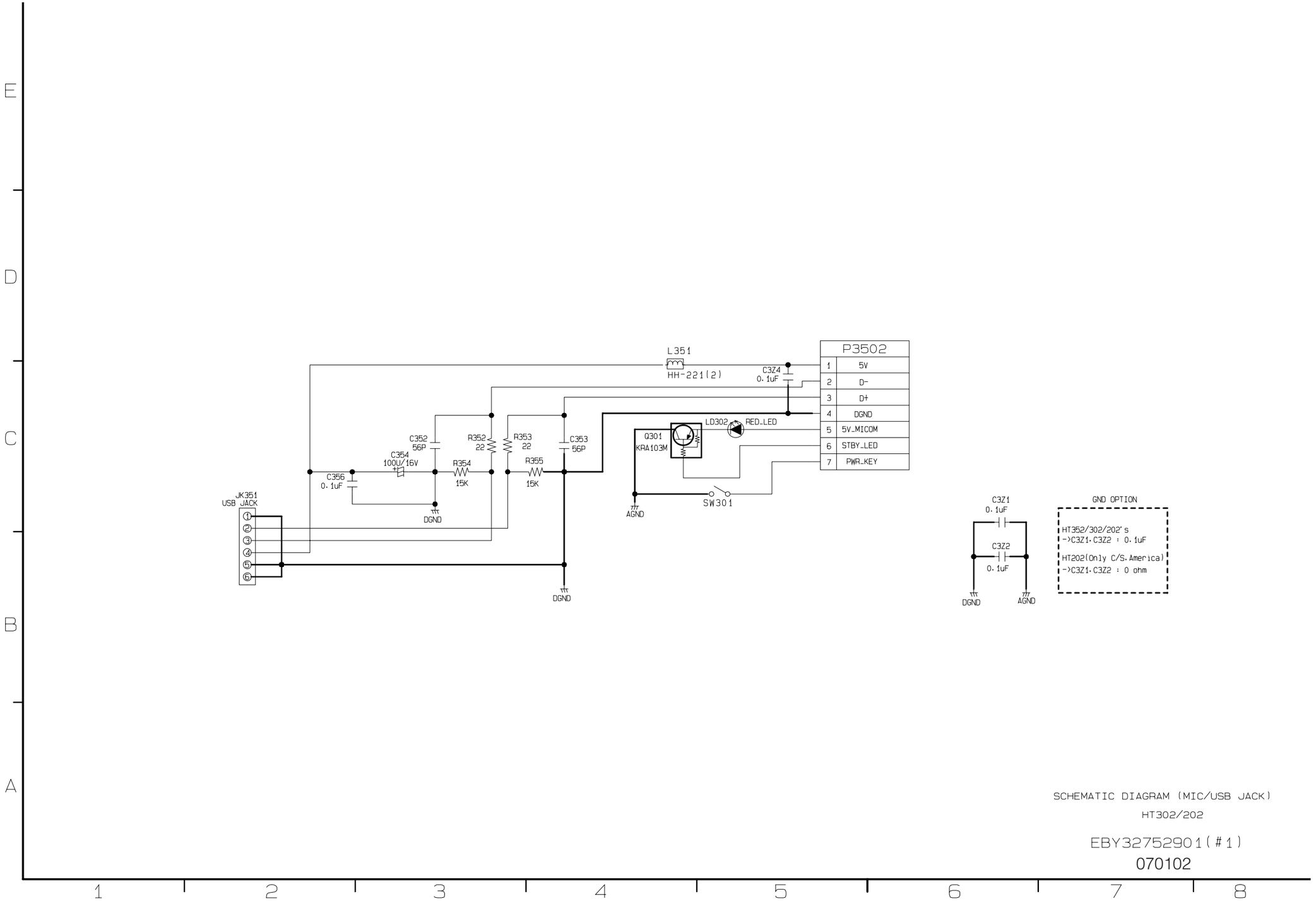
EBY32752601(#2)

061026

5. MIC CIRCUIT DIAGRAM



6. FRONT JACK CIRCUIT DIAGRAM



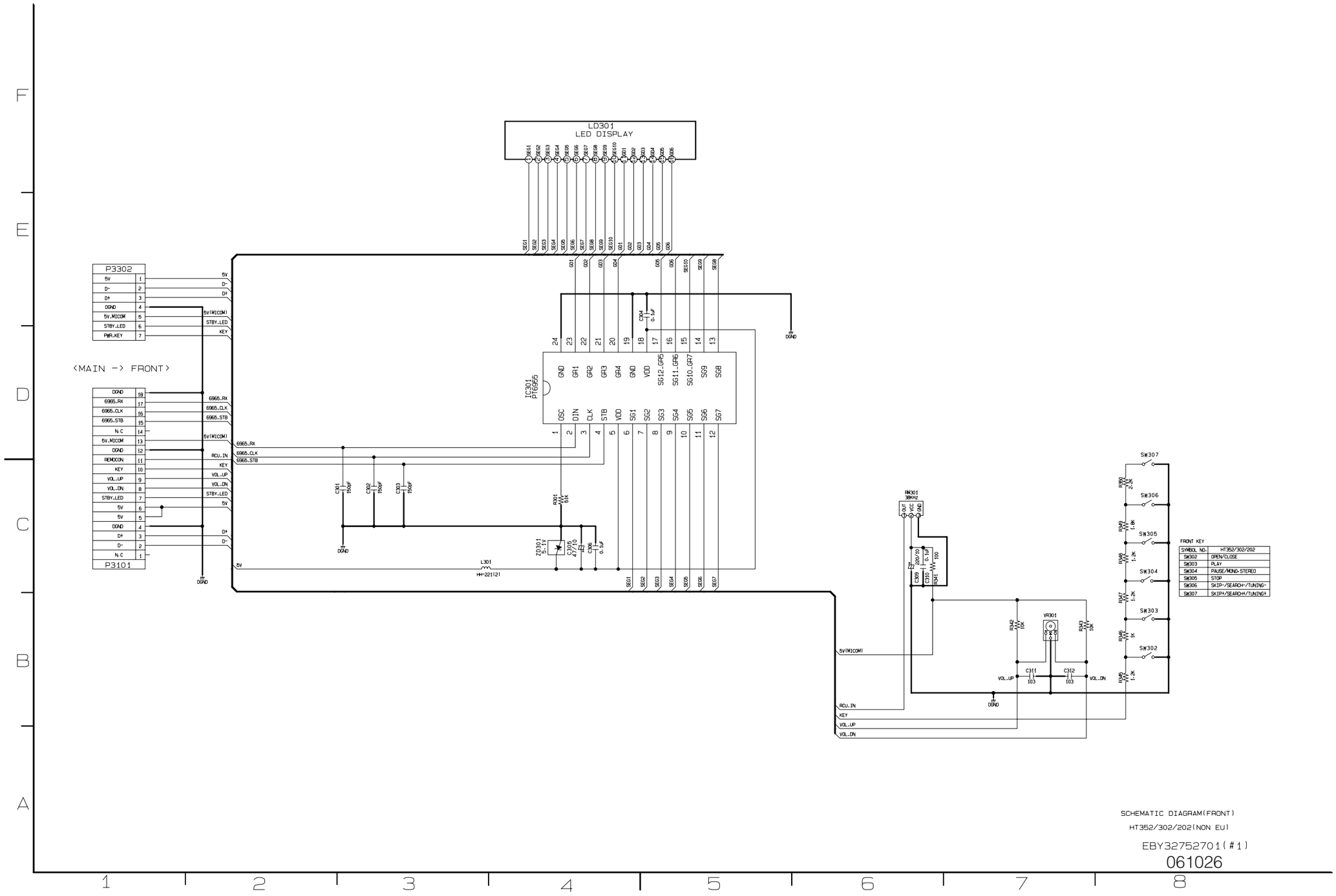
SCHEMATIC DIAGRAM (MIC/USB JACK)

HT302/202

EBY32752901(#1)

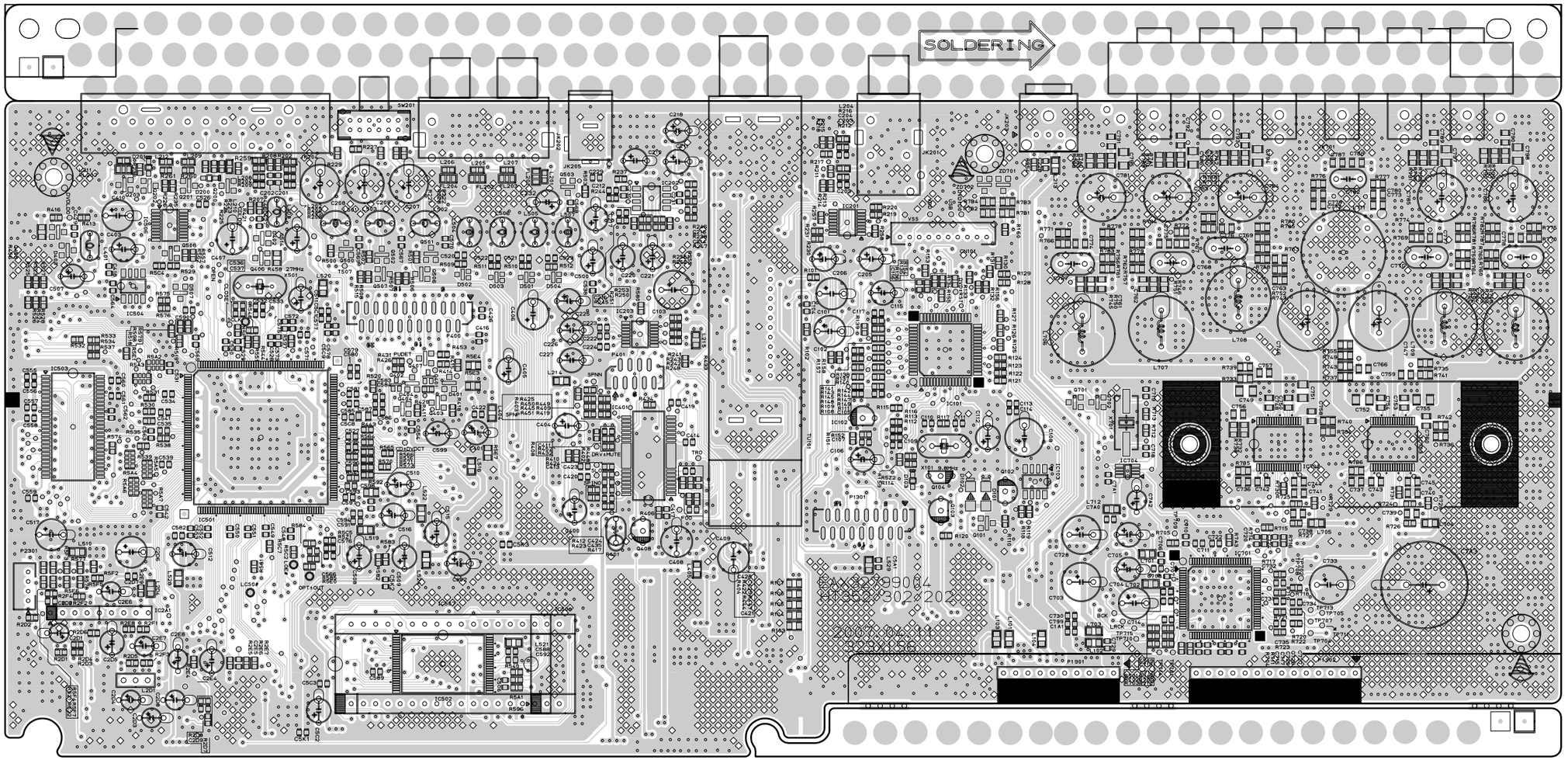
070102

7. FRONT CIRCUIT DIAGRAM

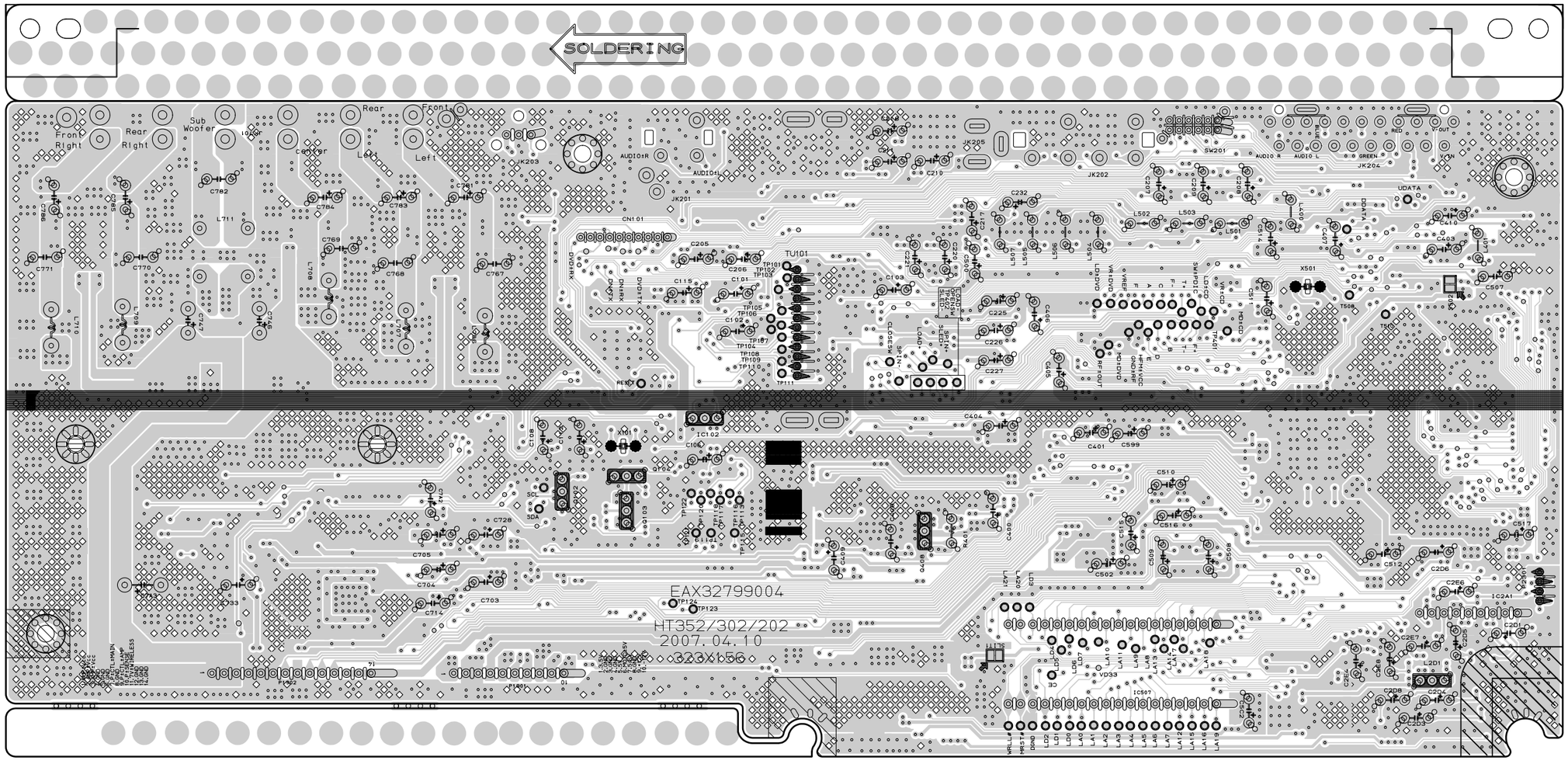


PRINTED CIRCUIT BOARD DIAGRAMS

1. MAIN P.C. BOARD DIAGRAM (TOP VIEW)

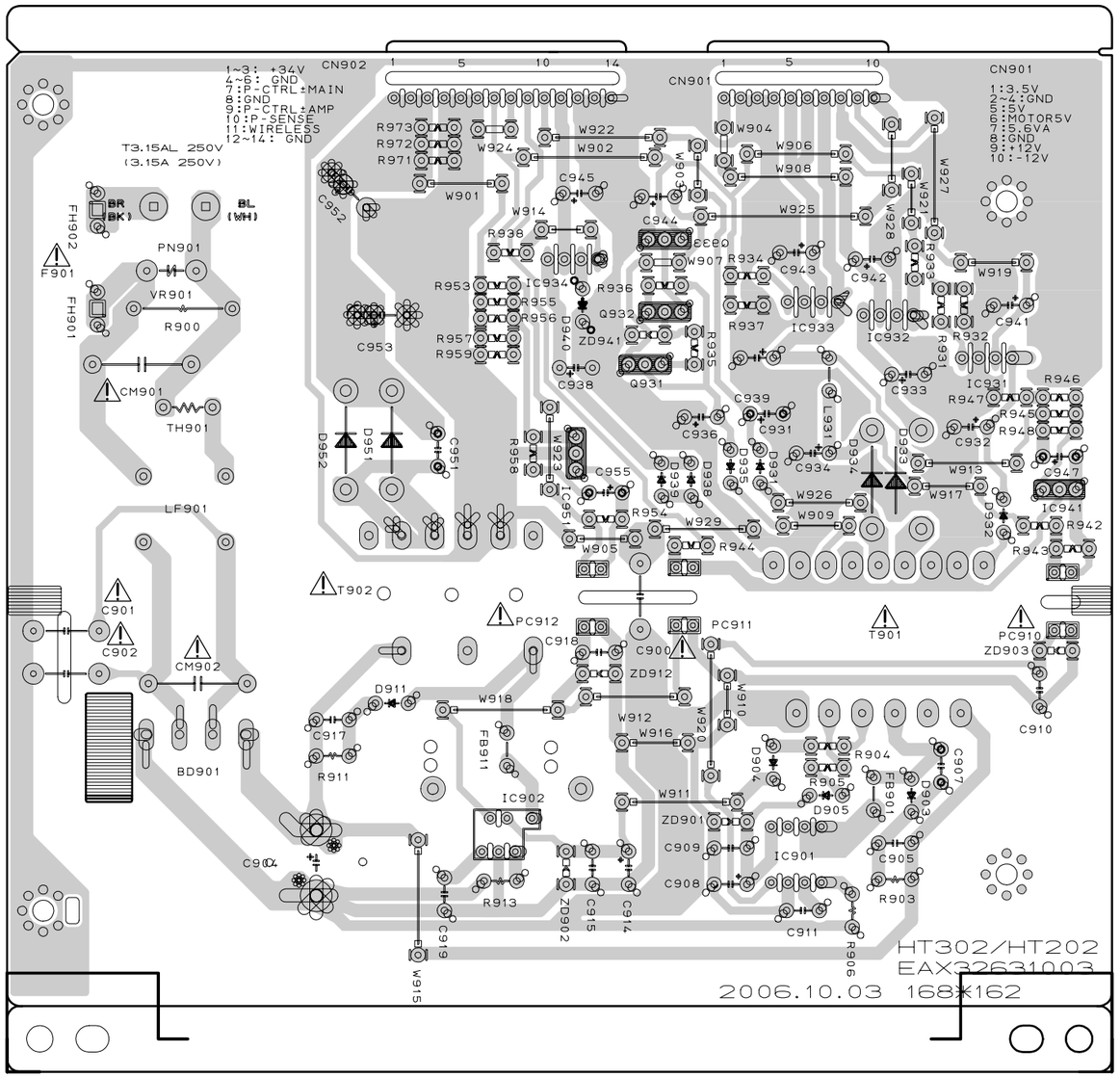


2. MAIN P.C. BOARD DIAGRAM (BOTTOM VIEW)

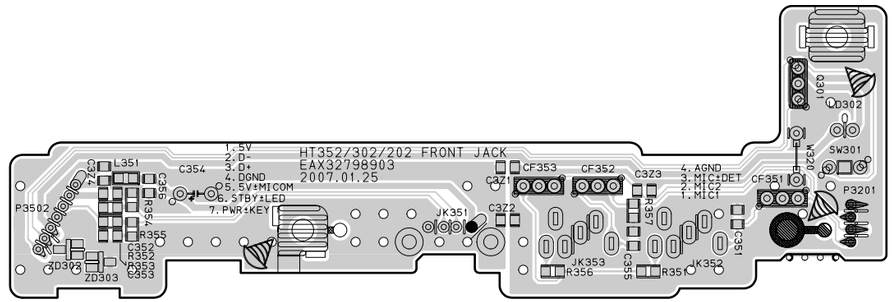


3. SMPS P.C. BOARD

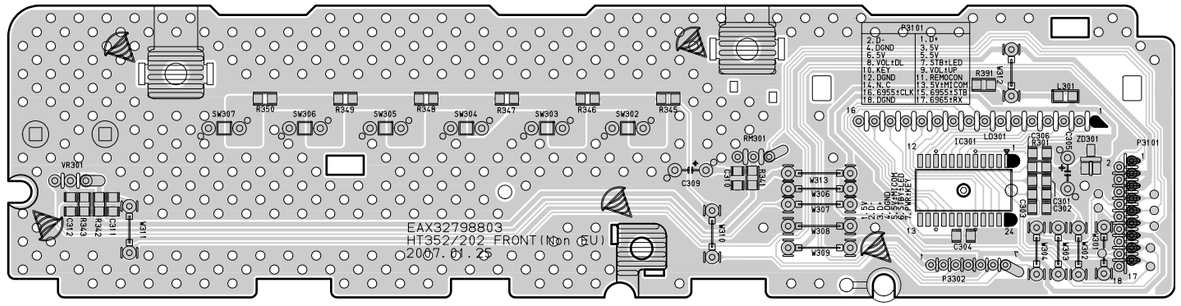
NOTE: Warning
⚠ Parts that are shaded are critical with respect to risk of fire or electrical shock.



4. FRONT JACK P.C BOARD



5. FRONT P.C.BOARD



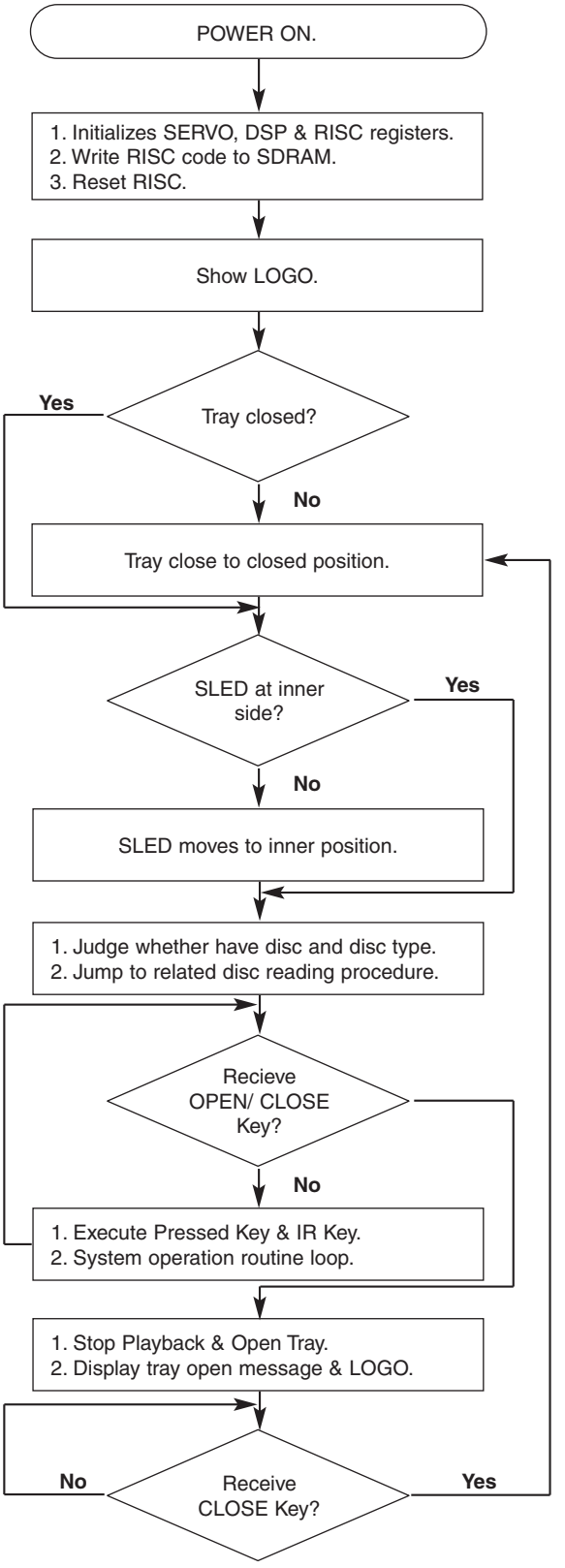
MEMO

MEMO

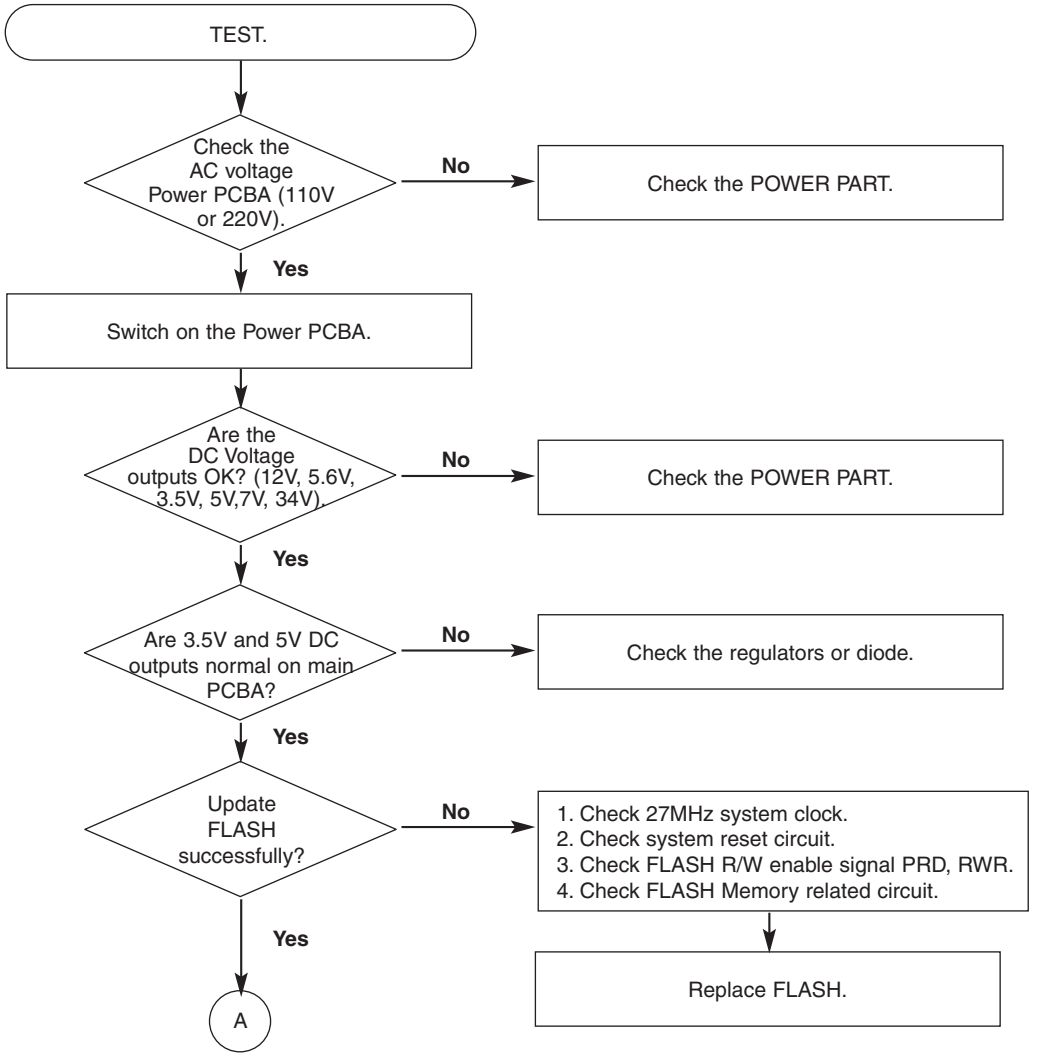
SECTION 3. DVD & AMP PART

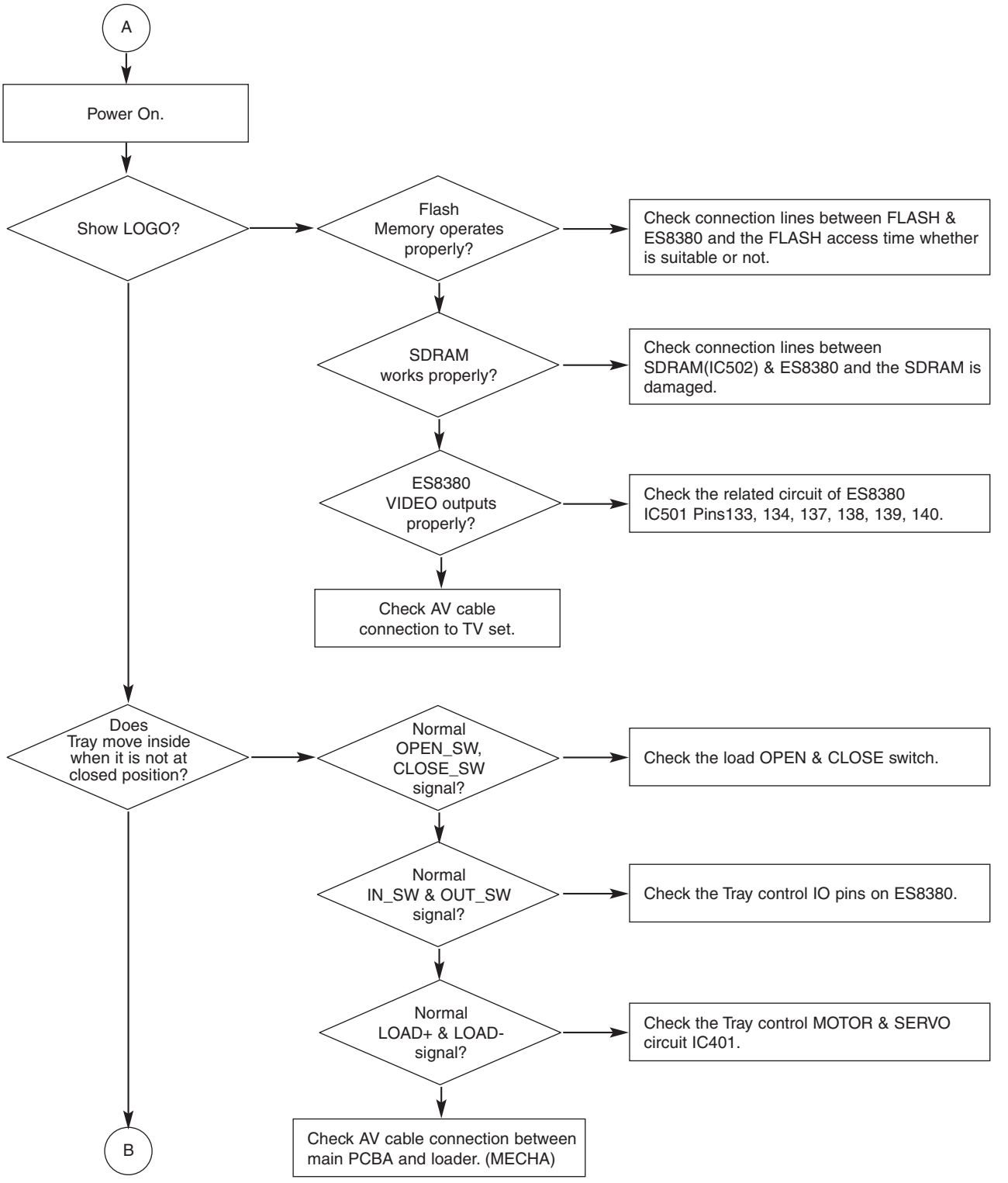
ELECTRICAL TROUBLESHOOTING GUIDE

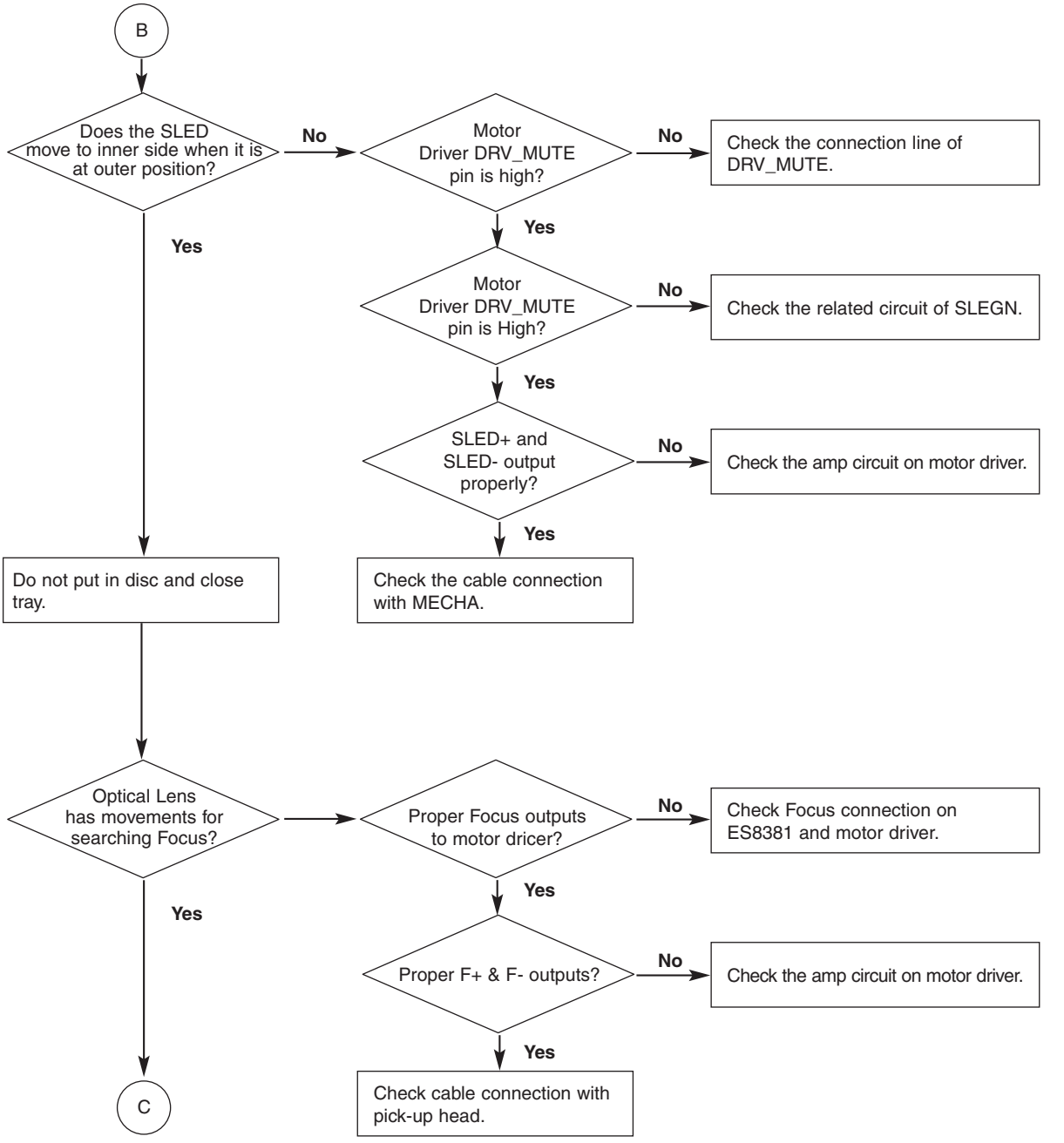
1. System operation flow

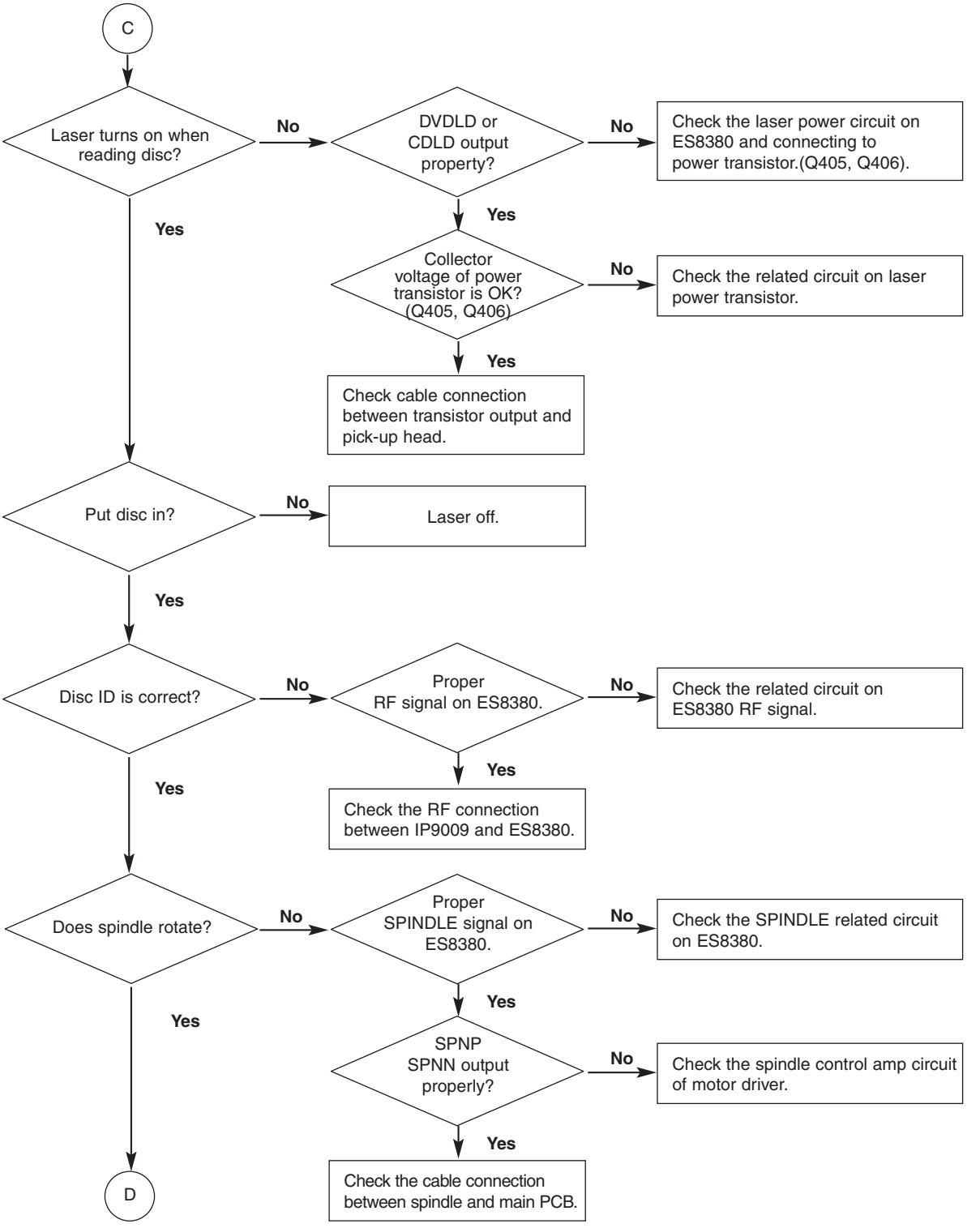


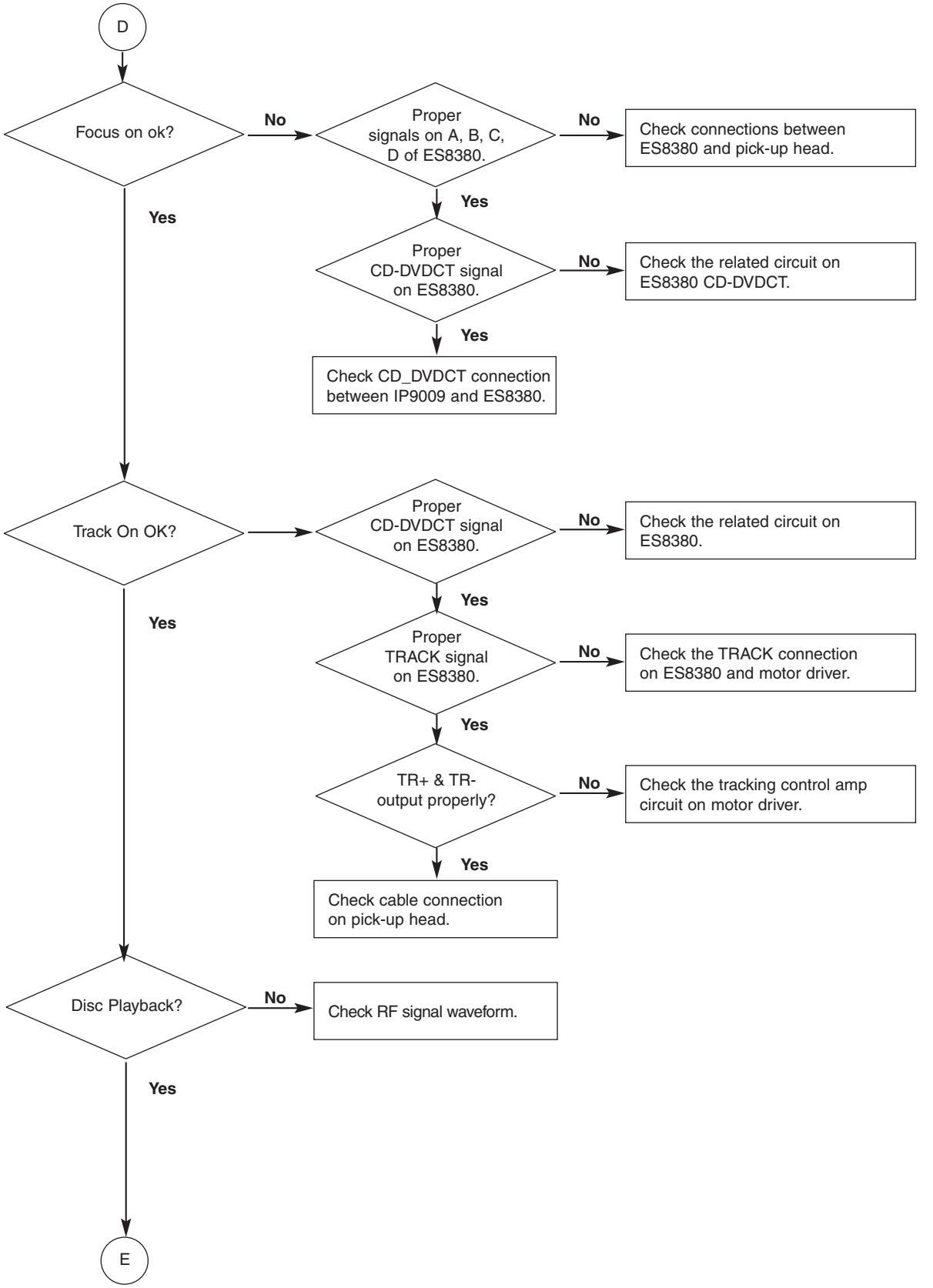
2. Test & debug flow

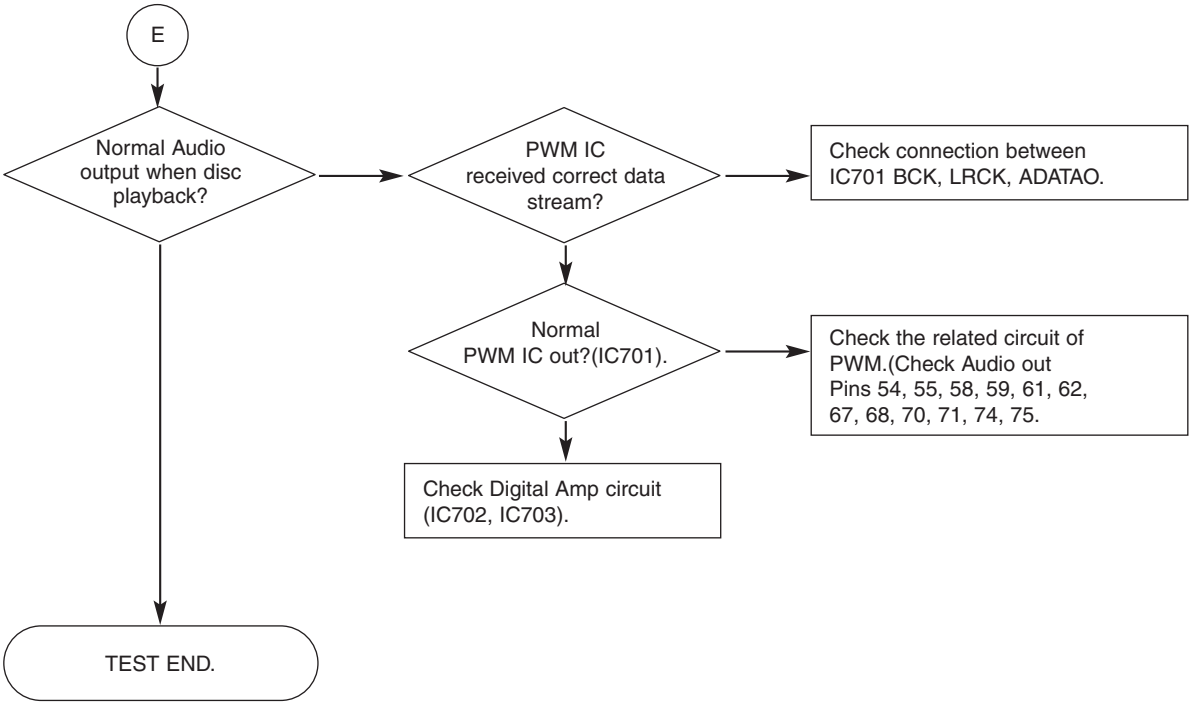



A
Power On.
Show LOGO?
Flash Memory operates properly?
Check connection lines between FLASH & ES8380 and the FLASH access time whether is suitable or not.
SDRAM works properly?
Check connection lines between SDRAM(IC502) & ES8380 and the SDRAM is damaged.
ES8380 VIDEO outputs properly?
Check the related circuit of ES8380 IC501 Pins133, 134, 137, 138, 139, 140.
Check AV cable connection to TV set.
Does Tray move inside when it is not at closed position?
Normal OPEN_SW, CLOSE_SW signal?
Check the load OPEN & CLOSE switch.
Normal IN_SW & OUT_SW signal?
Check the Tray control IO pins on ES8380.
Normal LOAD+ & LOAD- signal?
Check the Tray control MOTOR & SERVO circuit IC401.
Check AV cable connection between main PCBA and loader. (MECHA)
B

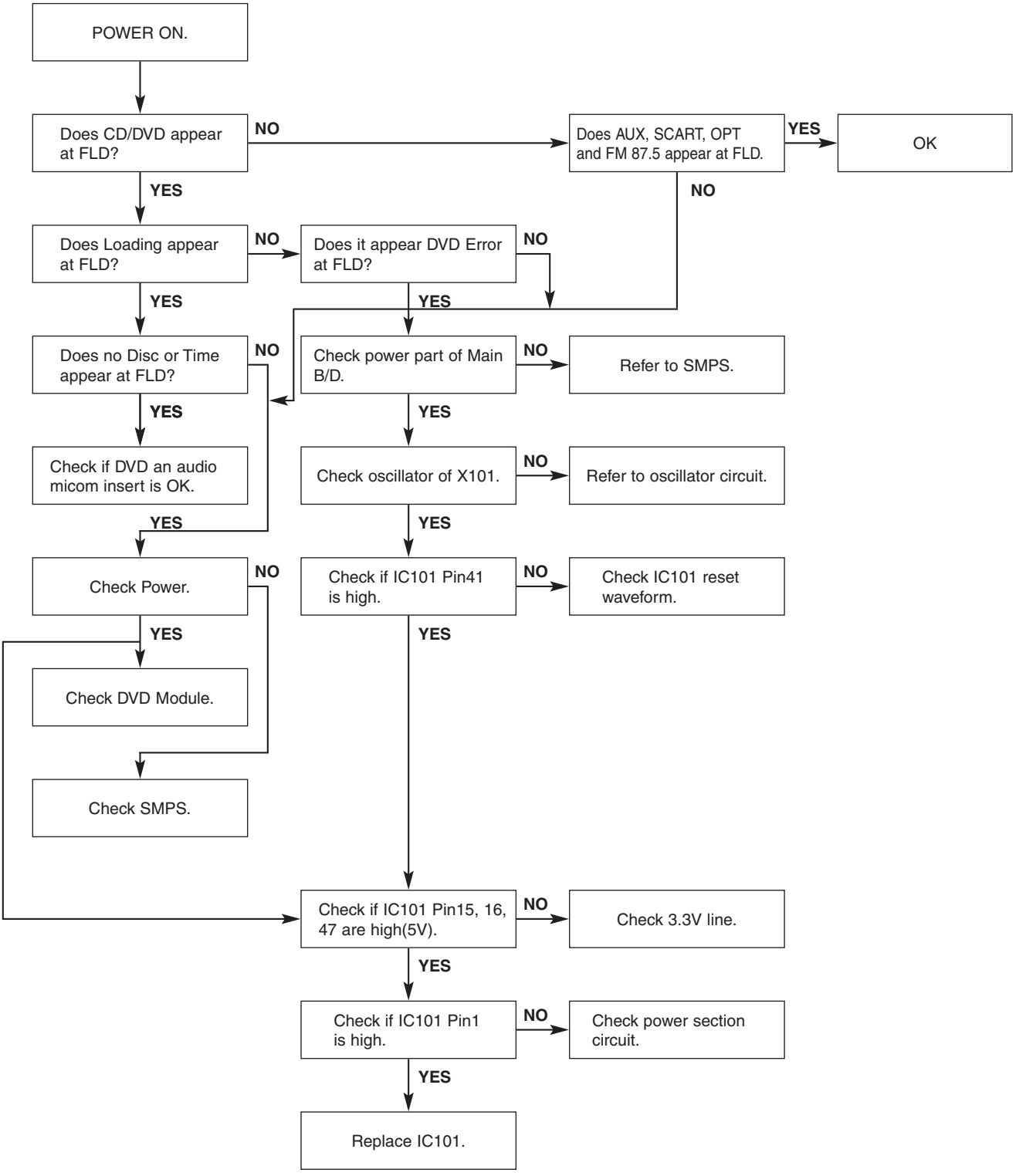

B
Does the SLED move to inner side when it is at outer position?
No
Motor Driver DRV_MUTE pin is high?
No
Check the connection line of DRV_MUTE.
Yes
Motor Driver DRV_MUTE pin is High?
No
Check the related circuit of SLEGN.
Yes
SLED+ and SLED- output properly?
No
Check the amp circuit on motor driver.
Yes
Check the cable connection with MECHA.
Yes
Do not put in disc and close tray.
Optical Lens has movements for searching Focus?
Proper Focus outputs to motor dricer?
No
Check Focus connection on ES8381 and motor driver.
Yes
Proper F+ & F- outputs?
No
Check the amp circuit on motor driver.
Yes
Check cable connection with pick-up head.
Yes
C


C
Laser turns on when reading disc?
No
DVDLD or CDLD output property?
No
Check the laser power circuit on ES8380 and connecting to power transistor.(Q405, Q406).
Yes
Yes
Collector voltage of power transistor is OK? (Q405, Q406)
No
Check the related circuit on laser power transistor.
Yes
Check cable connection between transistor output and pick-up head.
Yes
Put disc in?
No
Laser off.
Yes
Disc ID is correct?
No
Proper RF signal on ES8380.
No
Check the related circuit on ES8380 RF signal.
Yes
Yes
Check the RF connection between IP9009 and ES8380.
Does spindle rotate?
No
Proper SPINDLE signal on ES8380.
No
Check the SPINDLE related circuit on ES8380.
Yes
Yes
SPNP SPNN output properly?
No
Check the spindle control amp circuit of motor driver.
Yes
Check the cable connection between spindle and main PCB.
D


D
Focus on ok?
No
Proper signals on A, B, C, D of ES8380.
No
Check connections between ES8380 and pick-up head.
Yes
Yes
Proper CD-DVDCT signal on ES8380.
No
Check the related circuit on ES8380 CD-DVDCT.
Yes
Check CD_DVDCT connection between IP9009 and ES8380.
Track On OK?
Proper CD-DVDCT signal on ES8380.
No
Check the related circuit on ES8380.
Yes
Yes
Proper TRACK signal on ES8380.
No
Check the TRACK connection on ES8380 and motor driver.
Yes
TR+ & TR- output properly?
No
Check the tracking control amp circuit on motor driver.
Yes
Check cable connection on pick-up head.
Disc Playback?
No
Check RF signal waveform.
Yes
E


E
Normal Audio output when disc playback?
PWM IC received correct data stream?
Check connection between IC701 BCK, LRCK, ADATAO.
Normal PWM IC out?(IC701).
Check the related circuit of PWM.(Check Audio out Pins 54, 55, 58, 59, 61, 62, 67, 68, 70, 71, 74, 75.
Check Digital Amp circuit (IC702, IC703).
TEST END.

3. AUDIO µ-COM Circuit(DVD & AMP)



DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING

1. SYSTEM 27MHz CLOCK,RESET,FLASH R/W SIGNAL

1) ES8380 main clock is at 27MHz(X501)

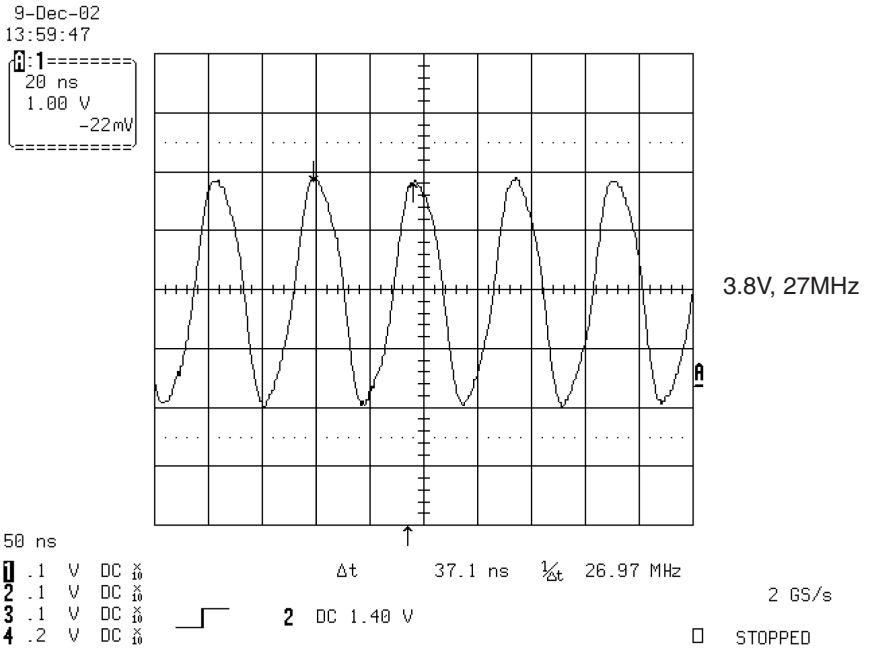


FIG 1-1

2) ES8380 reset is high active.

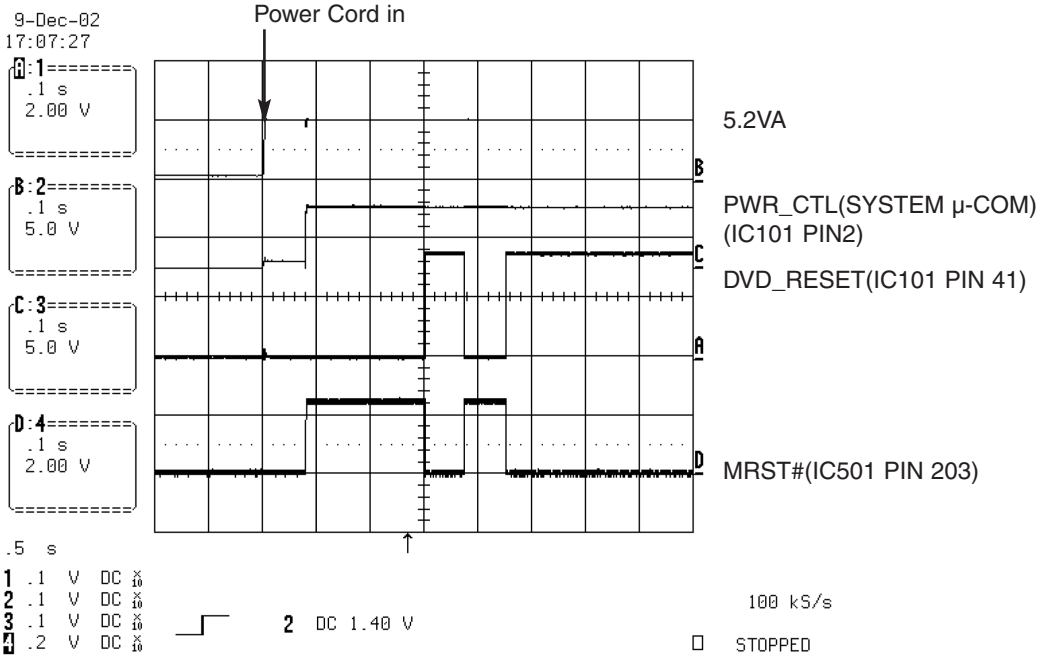


FIG 1-2

3) Flash R/W enable signal during download(Downloading)

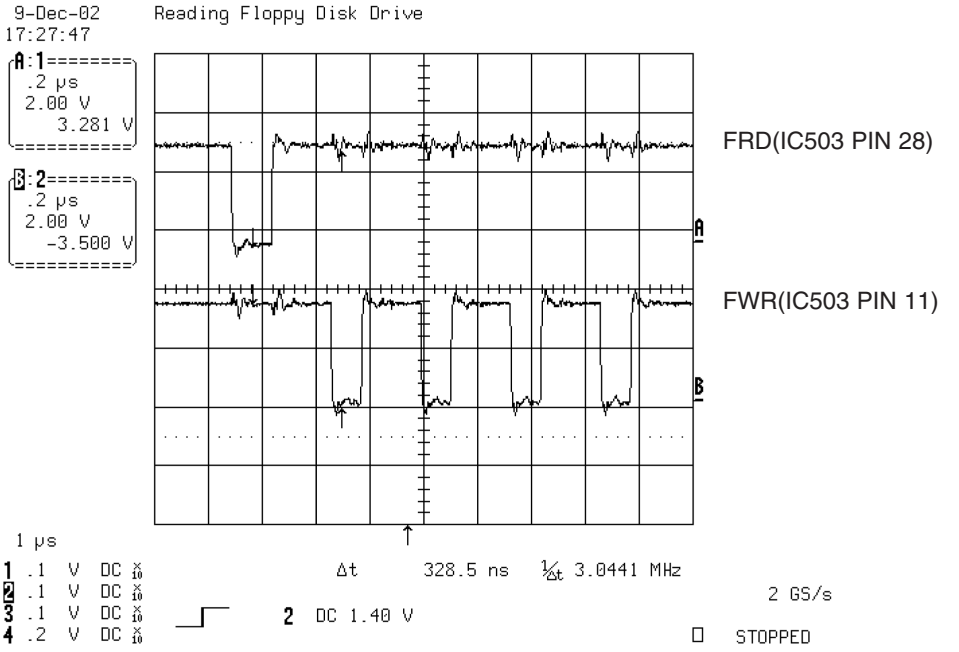


FIG 1-4

2. SDRAM CLOCK

1) ES8380 main clock is at 27MHz(X501)

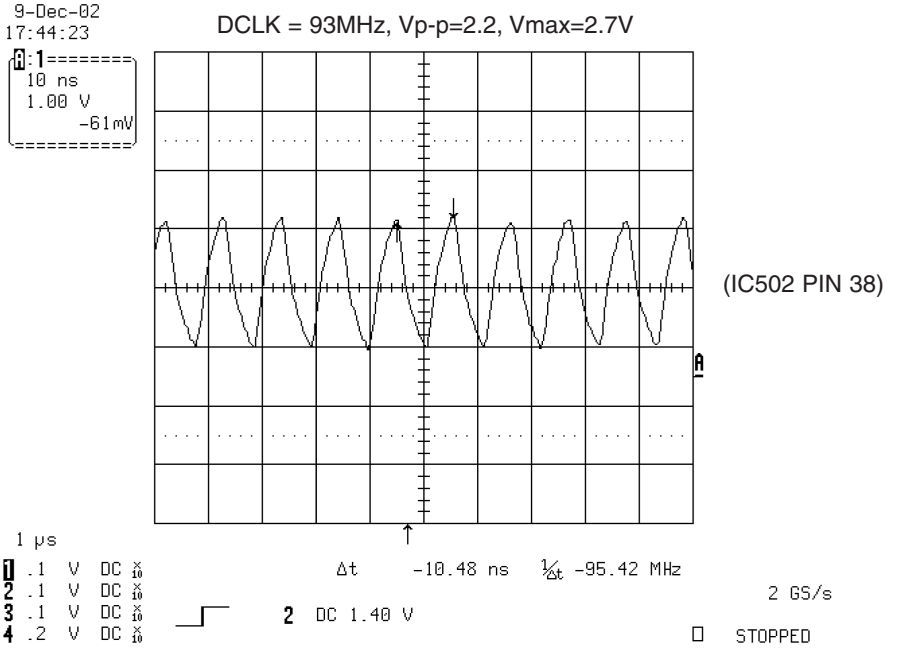


FIG 2-1

3. TRAY OPEN/CLOSE SIGNAL

1) Tray open/close waveform

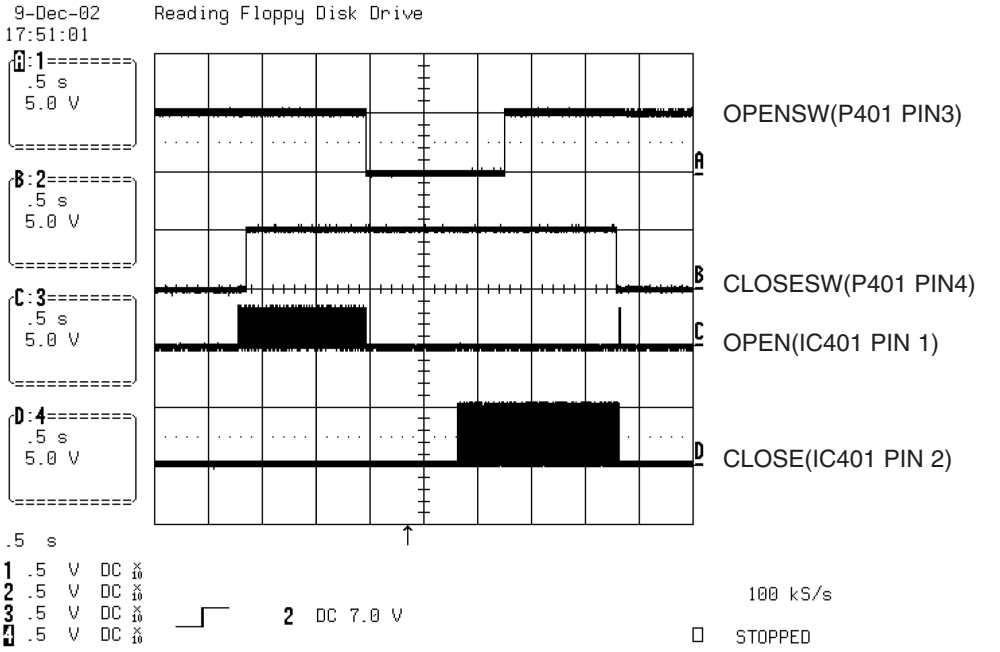


FIG 3-1

2) Tray close waveform

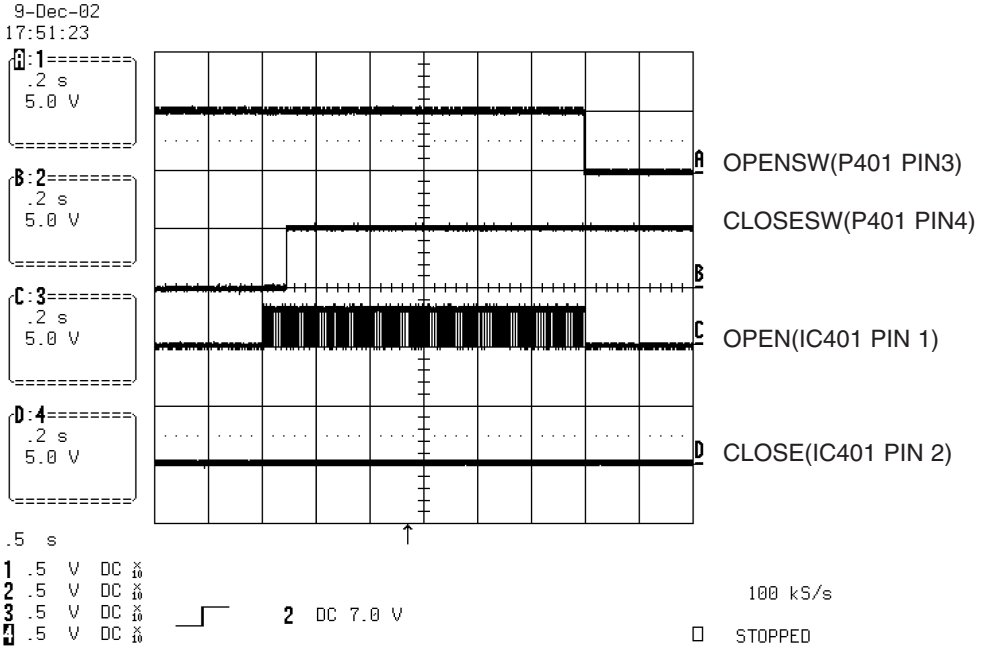


FIG 3-2

3) Tray open waveform

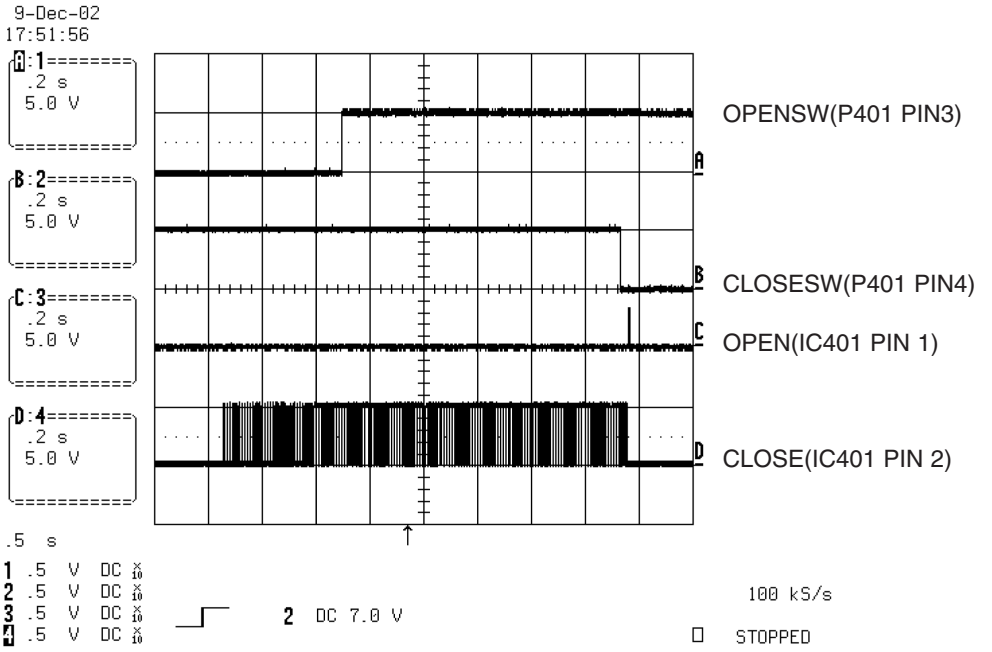


FIG 3-3

4. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)

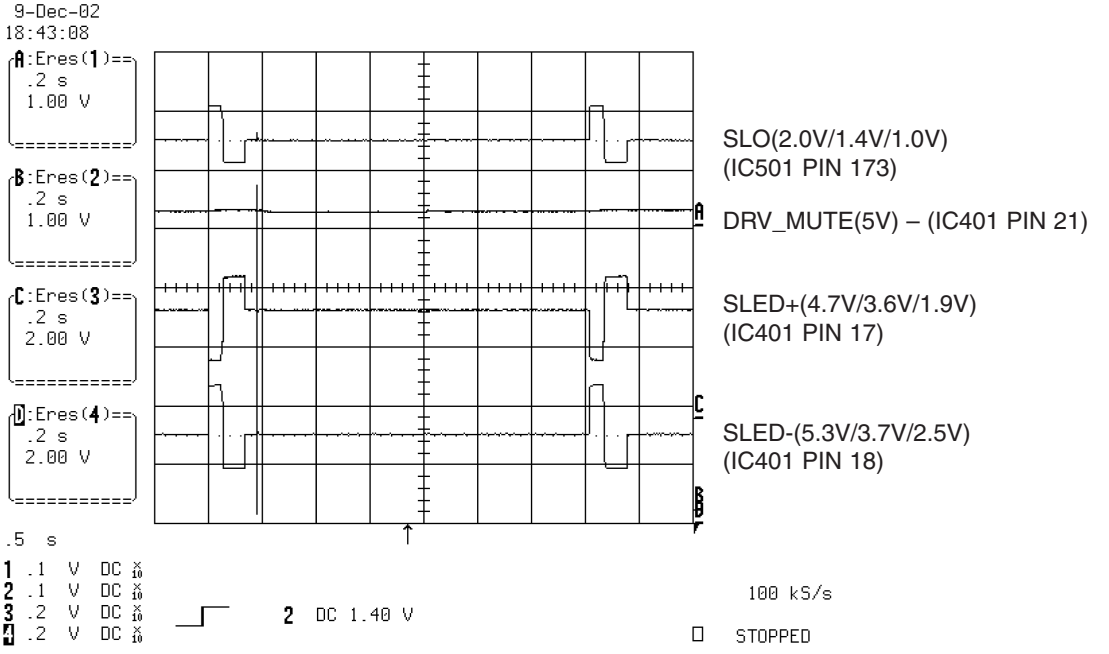


FIG 4-1

5. LENS CONTROL RELATED SIGNAL(NO DISC CONDITION)

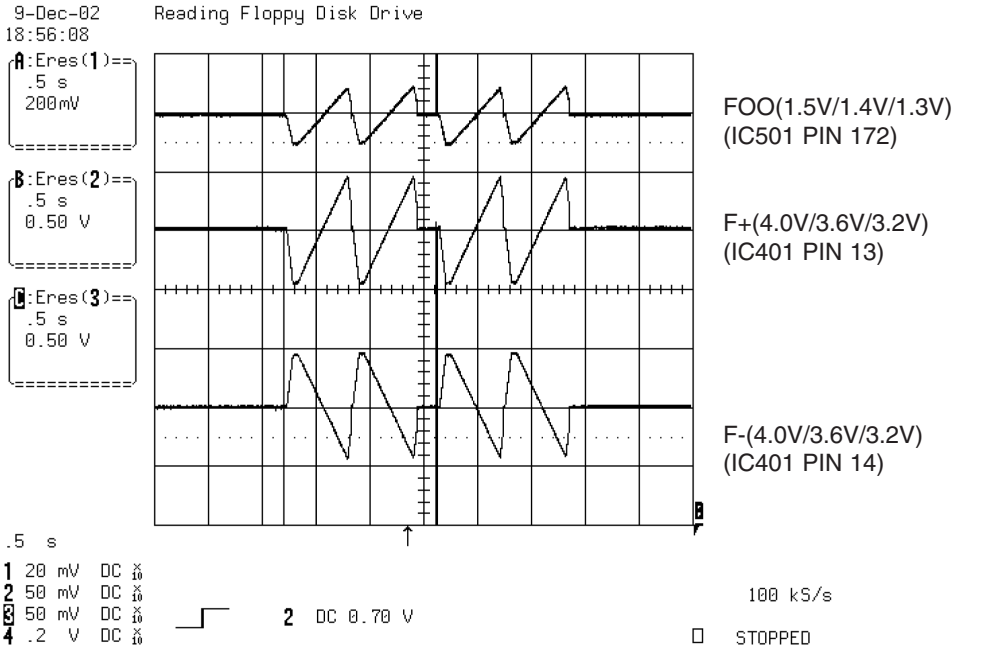


FIG 5-1

6. LASER POWER CONTROL RELATED SIGNAL(NO DISC CONDITION)

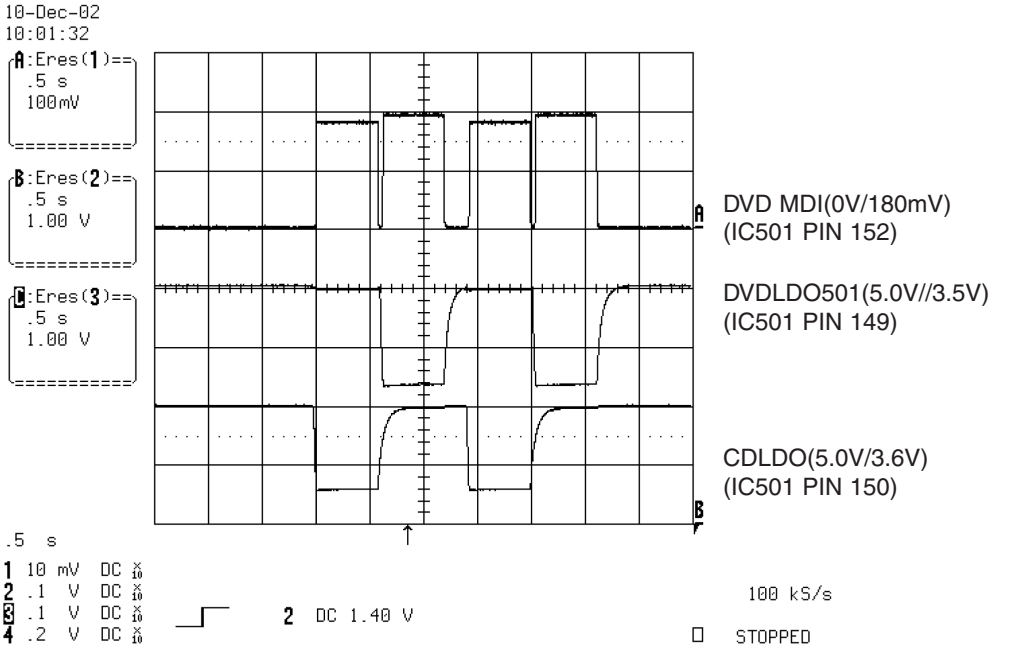
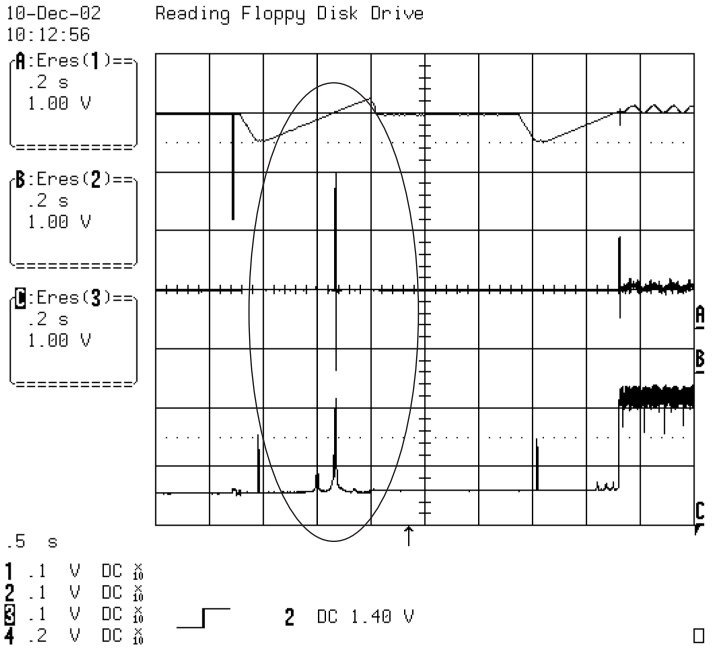


FIG 6-1

7. DISC TYPE JUDGEMENT WAVEFORMS

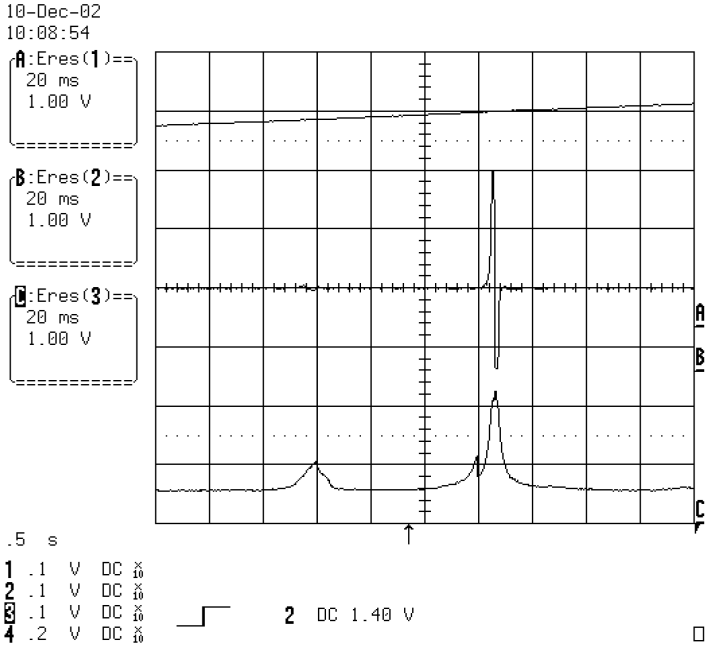


F+(IC401 PIN 13)

CD_DVDCT(IC501 PIN 133)

RF(IC501 PIN 160)

FIG 7-1 (DVD)



F+(IC401 PIN 13)

CD_DVDCT(IC501 PIN 133)

RF(IC501 PIN 160)

FIG 7-2 (DVD)

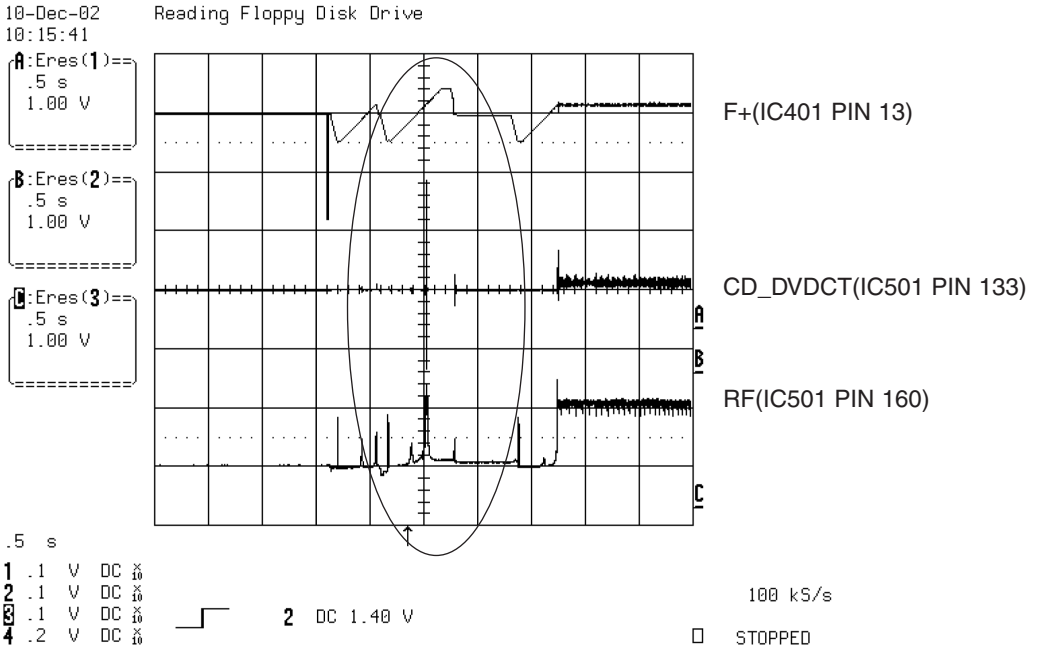


FIG 7-3 (CD)

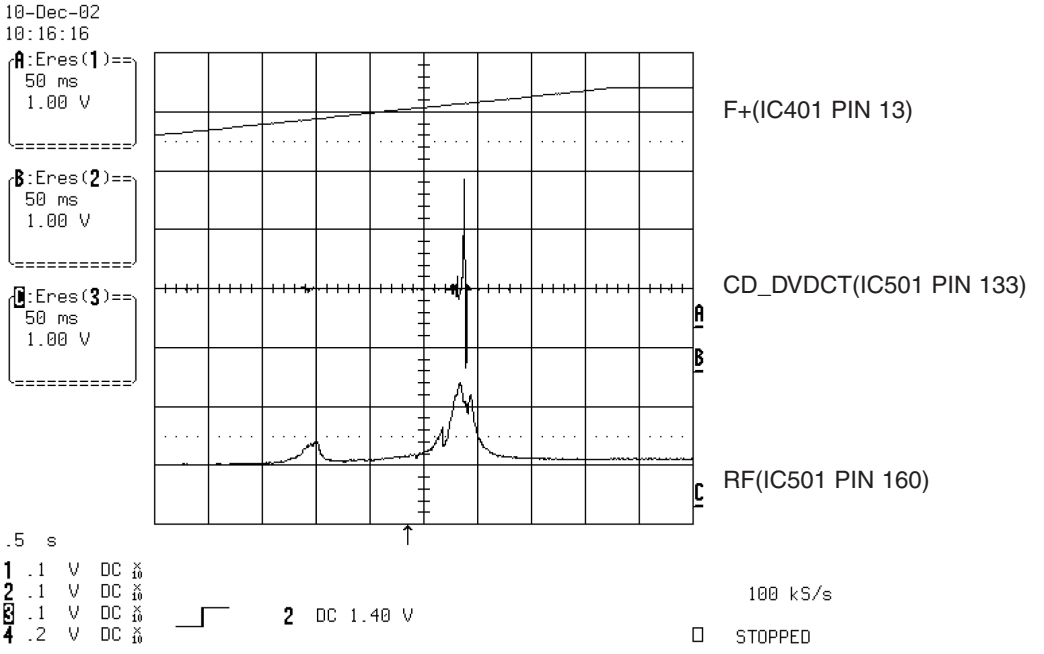


FIG 7-4 (CD)

8. FOCUS ON WAVEFORMS

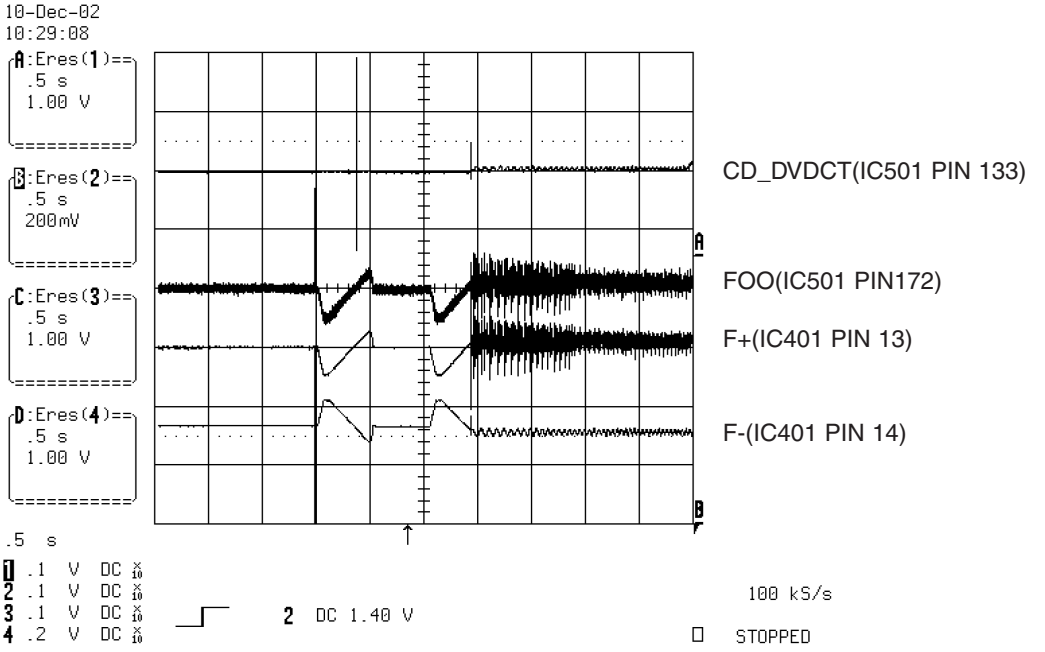


FIG 8-1 (DVD)

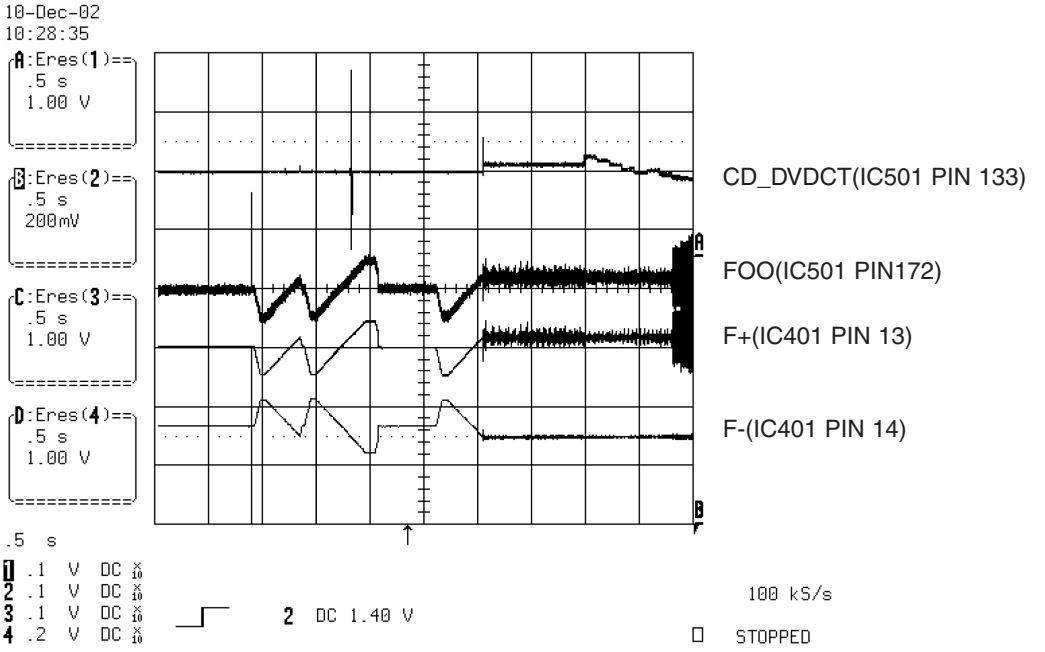


FIG 8-2 (CD)

9. SPINDLE CONTROL WAVEFORMS (NO DISC CONDITION)

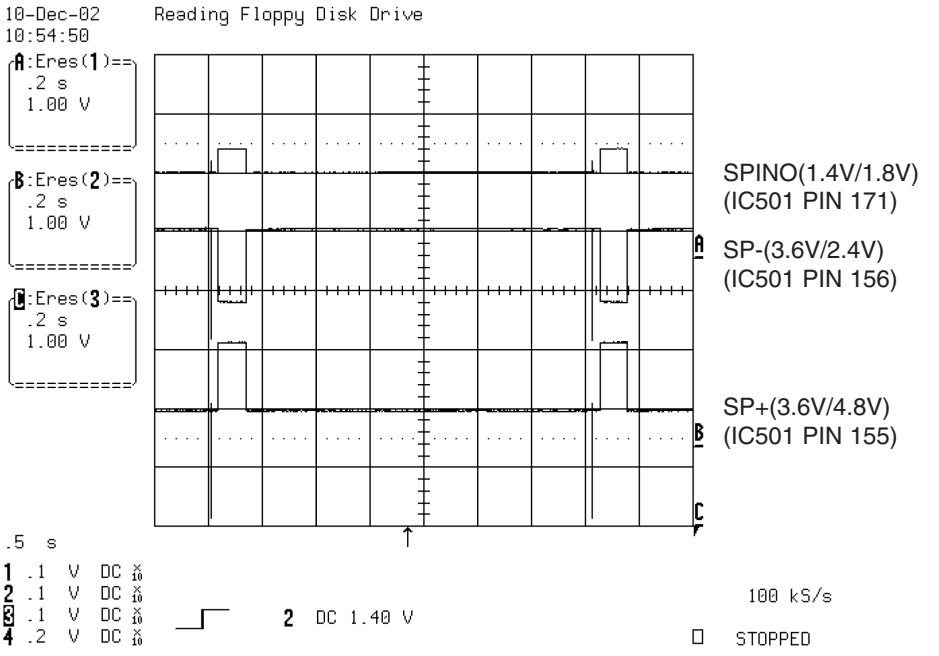


FIG 9-1

10. TRACKING CONTROL RELATED SIGNAL(System checking)

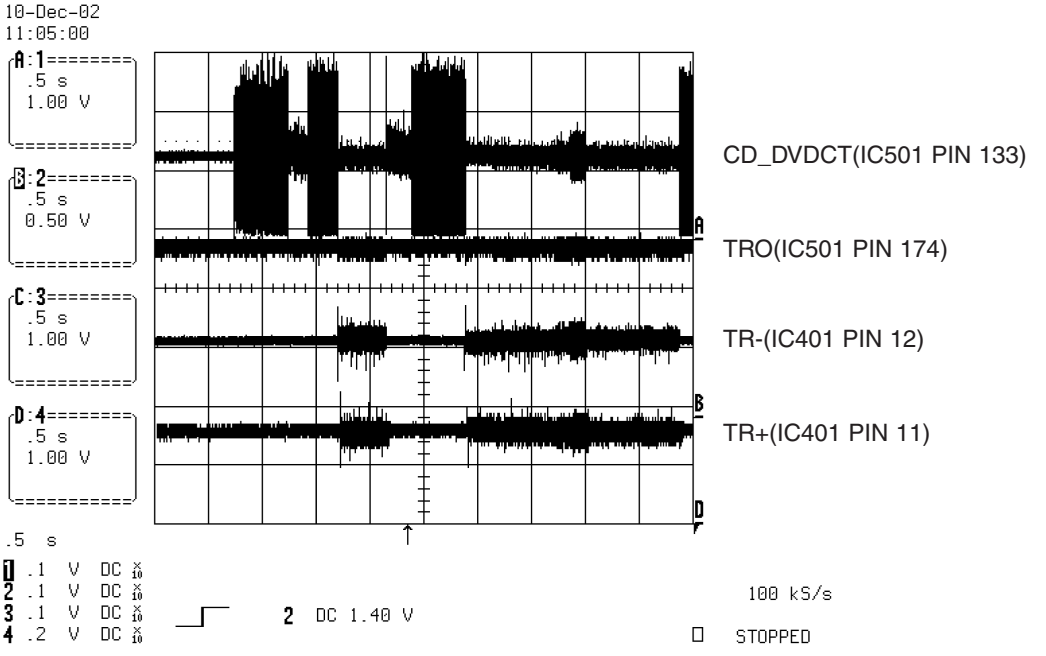


FIG 10-1(DVD)

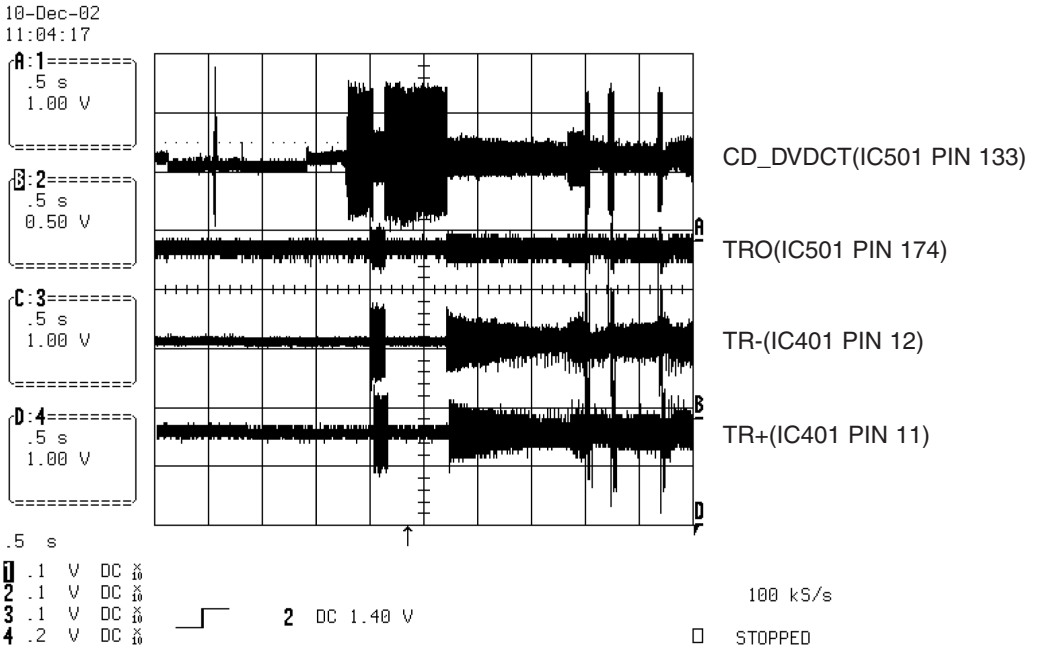


FIG 10-2(CD)

11. ES8380 VIDEO OUTPUT WAVEFORMS

1) Full colorbar signal(COMPOSIT)

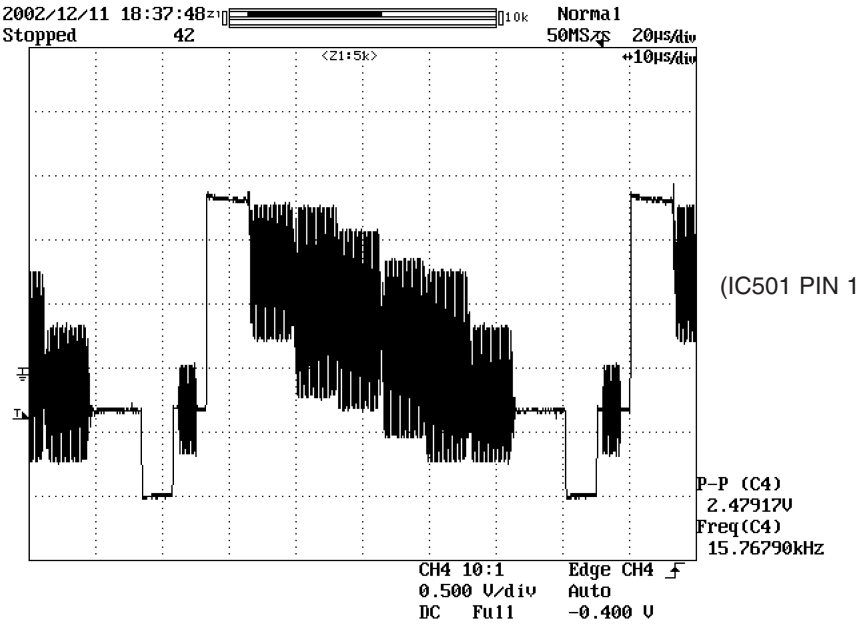
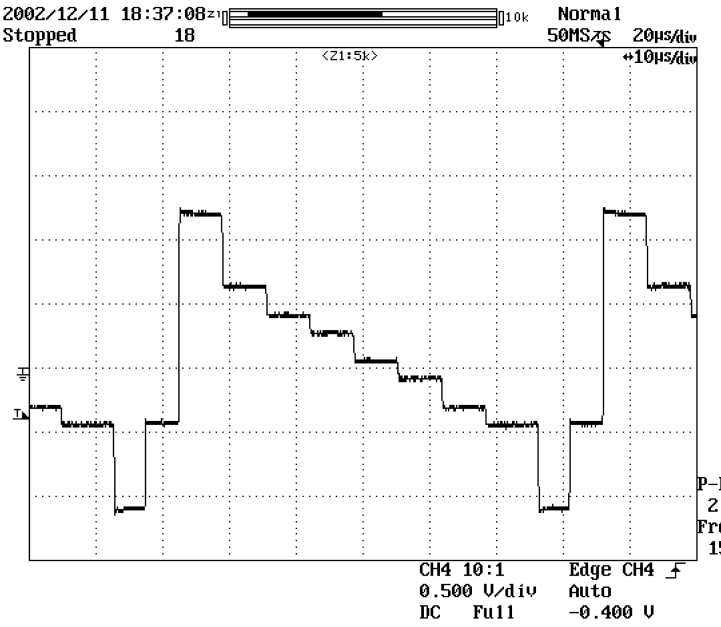


FIG 11-1

2) Y

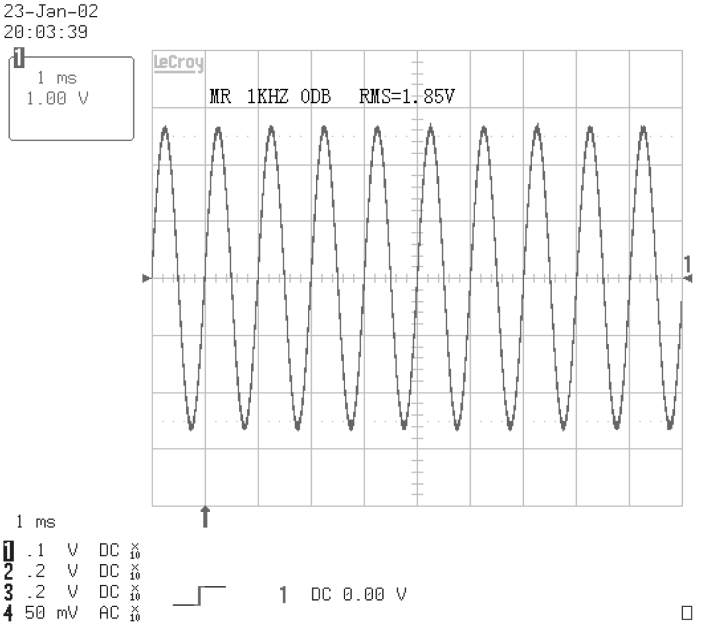


(IC501 PIN 113)

FIG 11-2

12. AUDIO OUTPUT FROM PWM IC

1) Audio L/R



(IC701 PIN 1, 7)

FIG 12-1

2) Audio related Signal

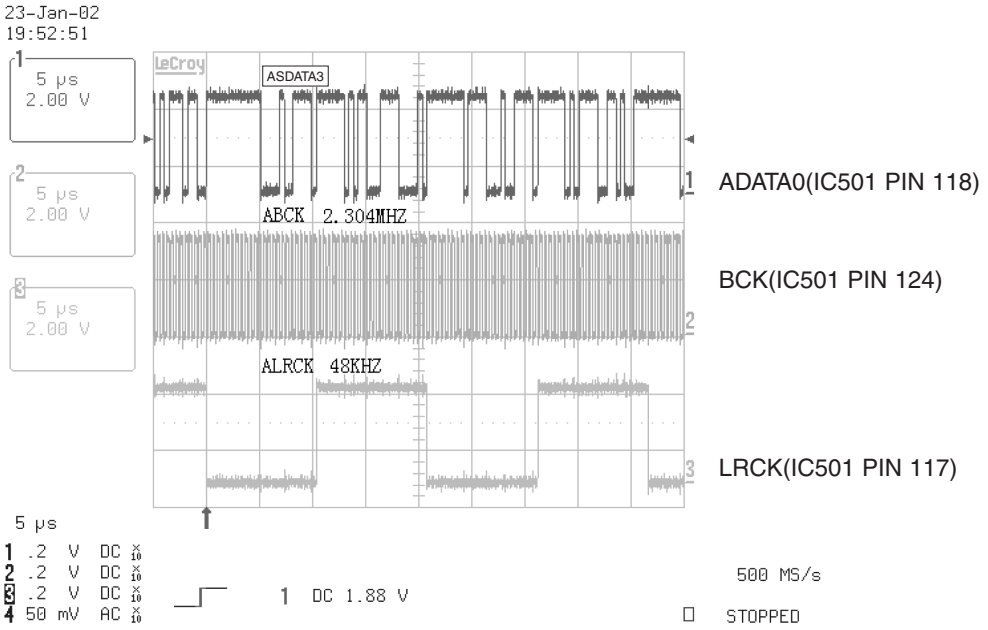
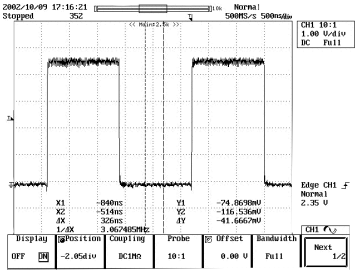


FIG 12-2

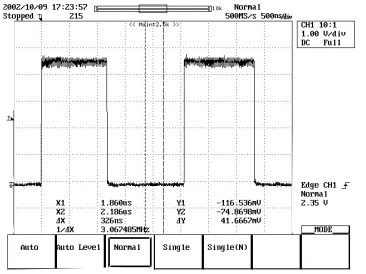
13. DVD & AMP WAVEFORMS

1)



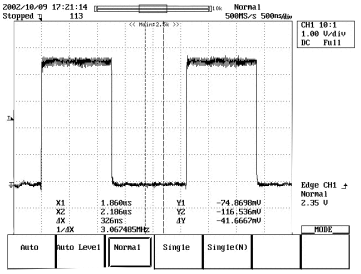
- R620 → TP611
  or
  R621 TP612

2)



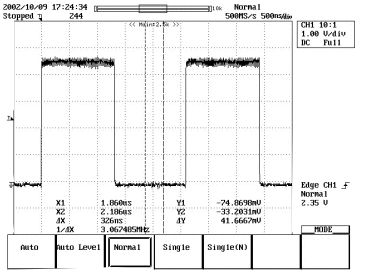
- R618 → TP609
  or
  R619 TP610

3)



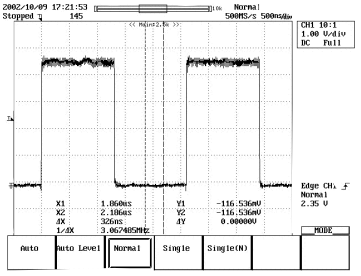
- R612 → TP603
  or
  R613 TP604

4)



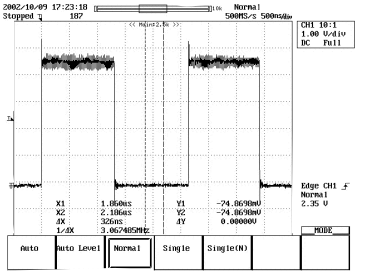
- R610 → TP601
  or
  R611 TP602

5)



- R614 → TP605
  or
  R615 TP606

6)

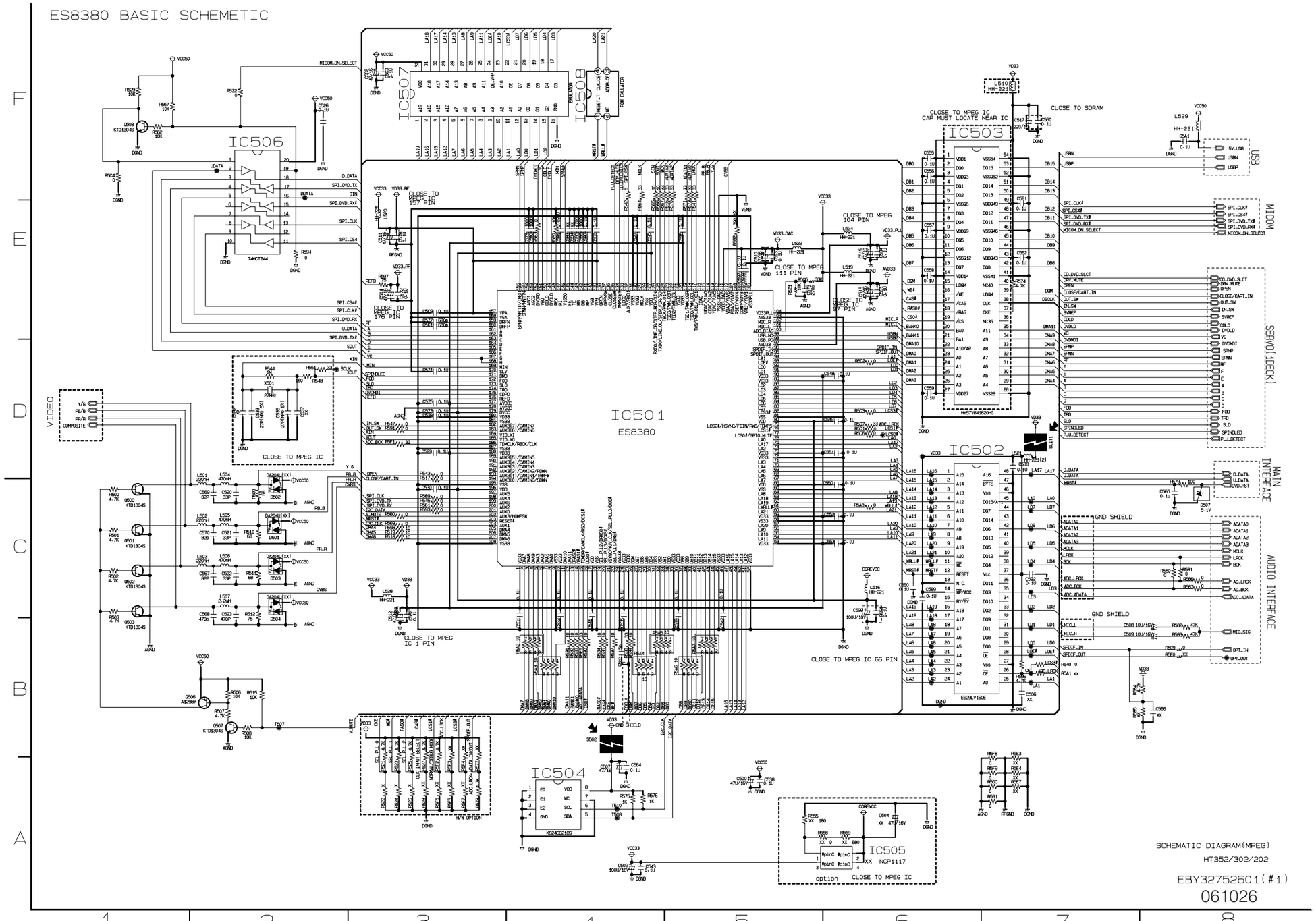


- R616 → TP607
  or
  R617 TP608

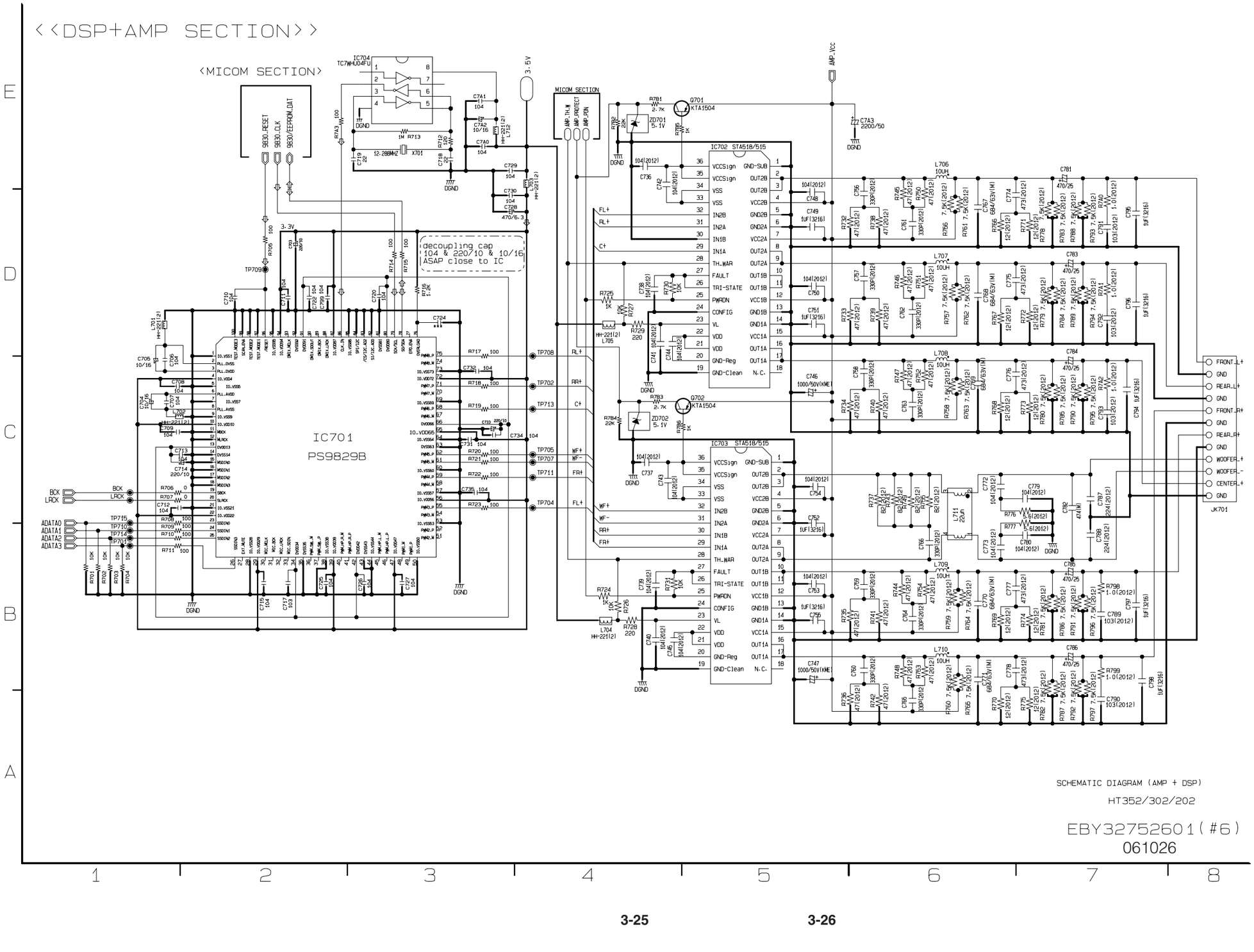
MEMO

DVD & AMP CIRCUIT DIAGRAM

1. MPEG CIRCUIT DIAGRAM



2. DSP & AMP CIRCUIT DIAGRAM



SCHEMATIC DIAGRAM (AMP + DSP)

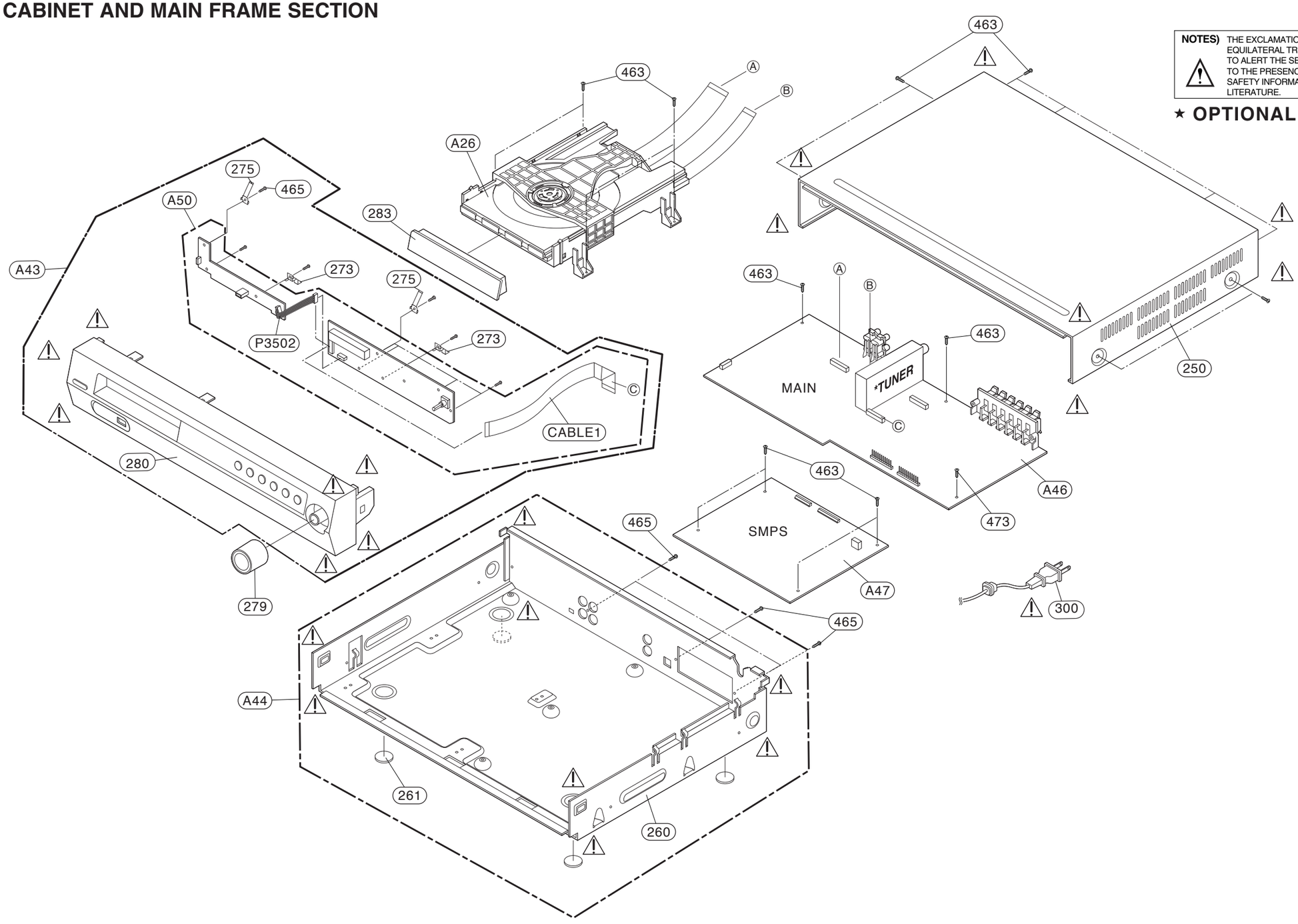
HT352/302/202

EBY32752601(#6)

061026

SECTION 4. EXPLODED VIEWS

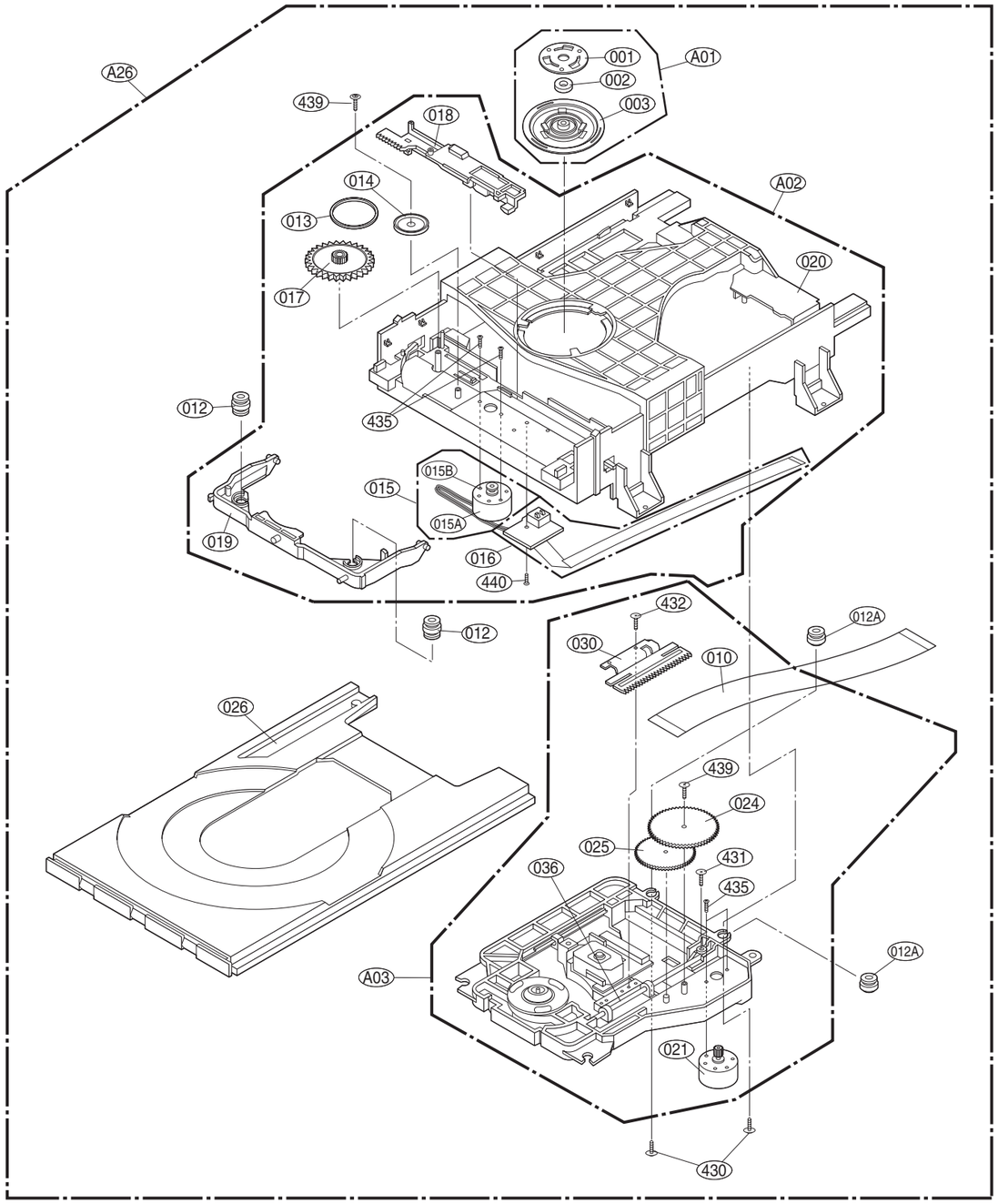
• CABINET AND MAIN FRAME SECTION



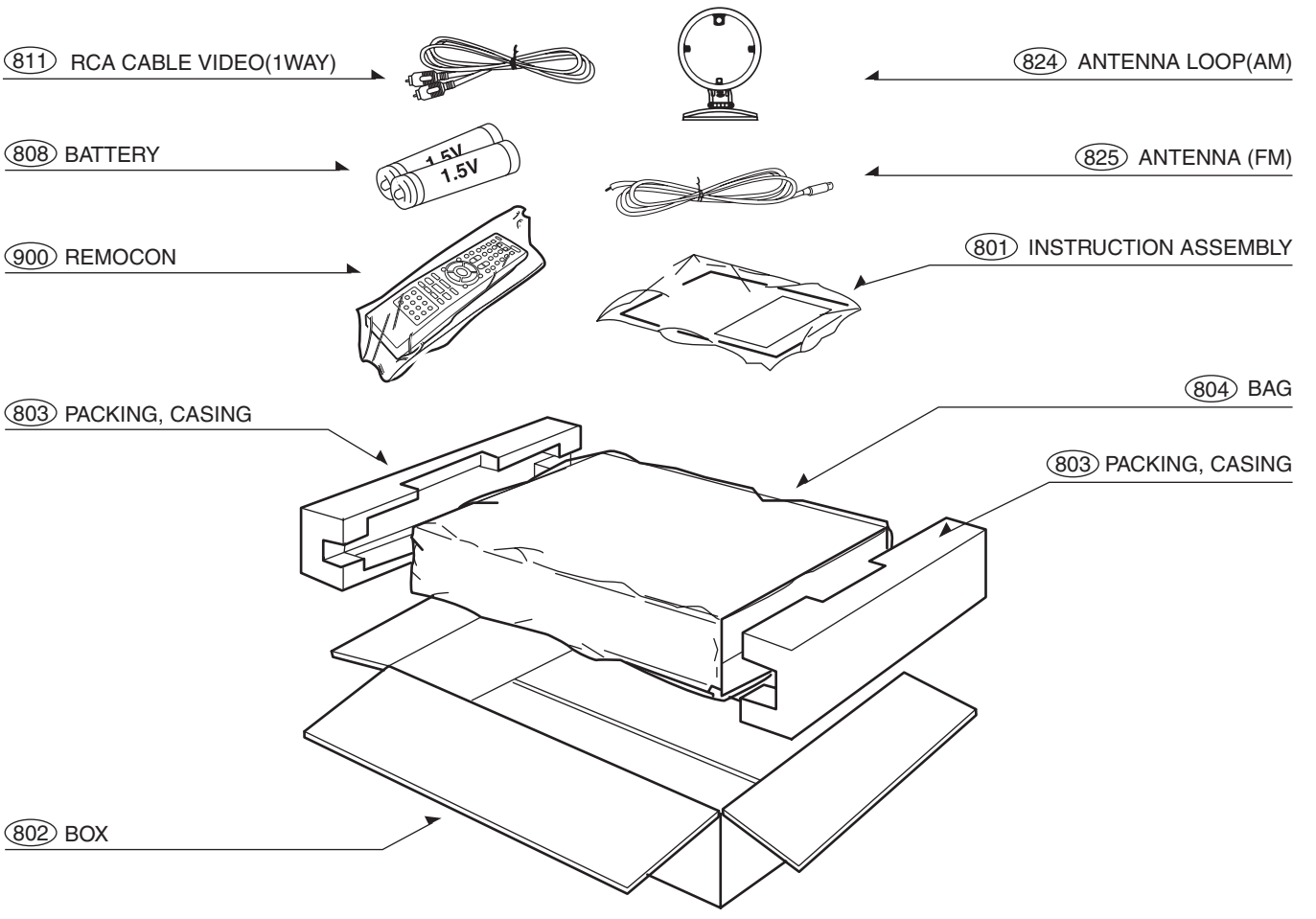
NOTES) THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

★ **OPTIONAL PART**

• DECK MECHANISM EXPLODED VIEW(DP-10T)



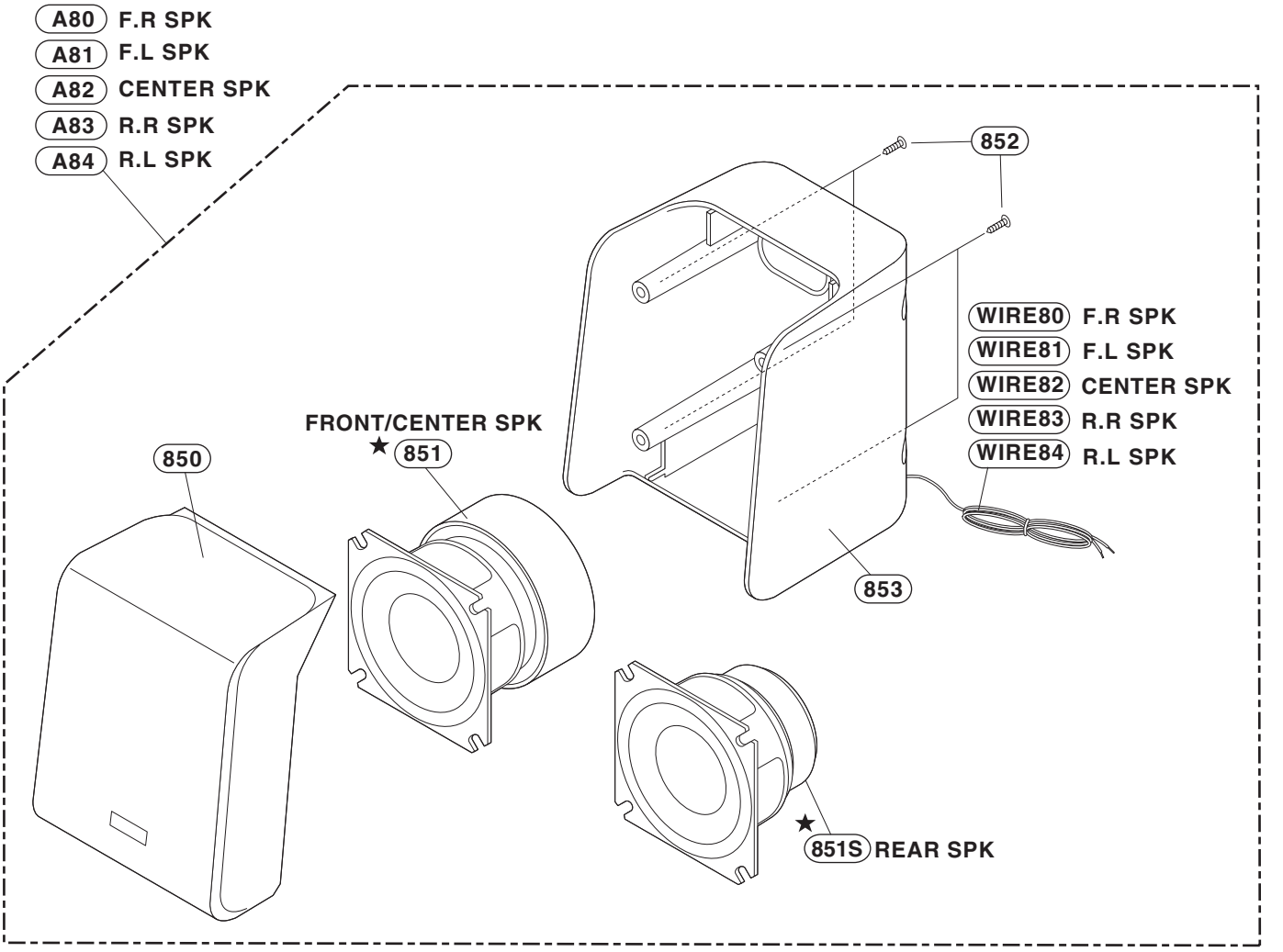
• PACKING ACCESSORY SECTION



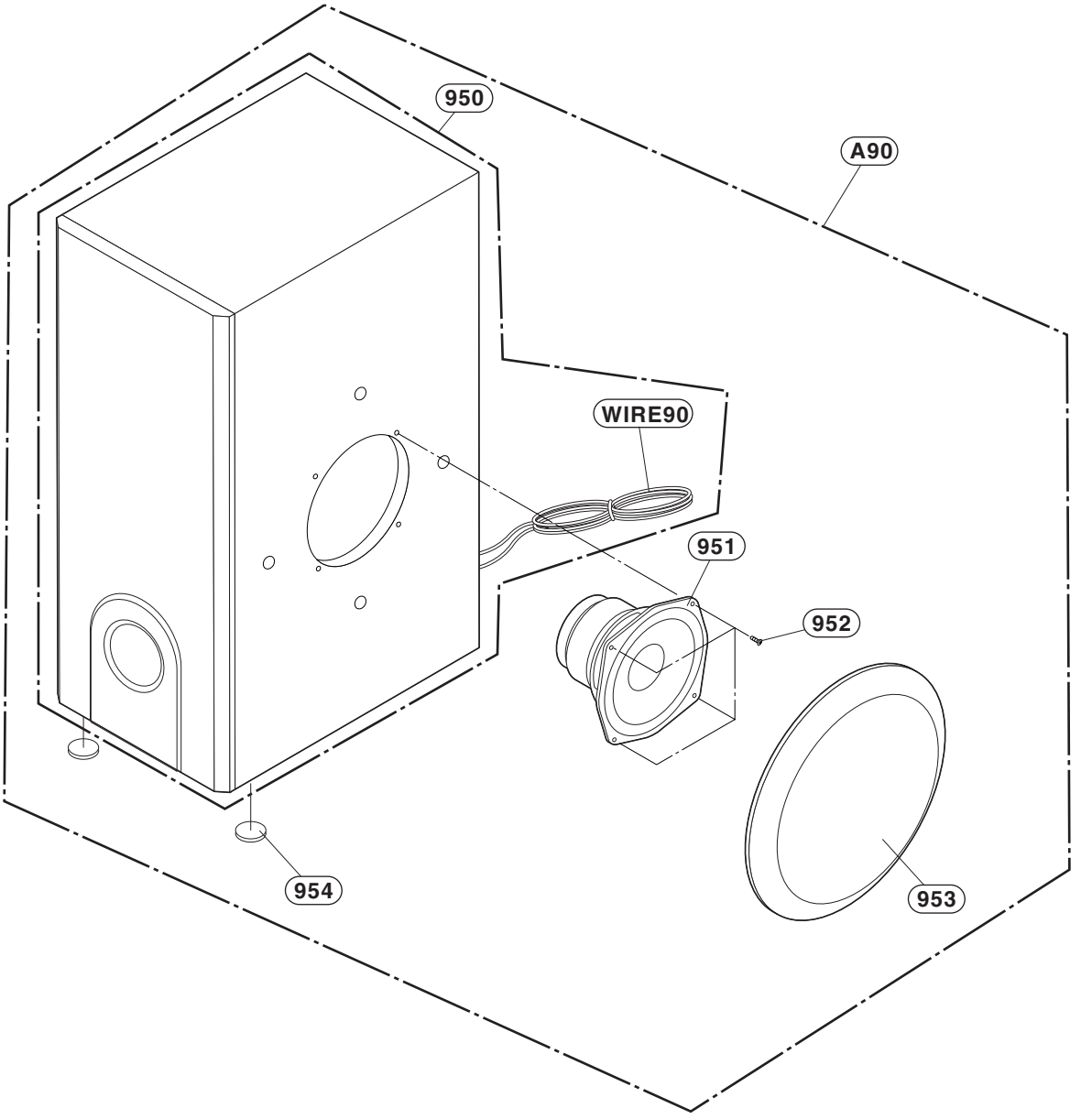
SECTION 5. SPEAKER SECTION

• FRONT/CENTER/REAR SPEAKER (SH22SF-SY)

★ OPTIONAL PART



• PASSIVE SUBWOOFER SPEAKER (SH22SF-WY)



MEMO